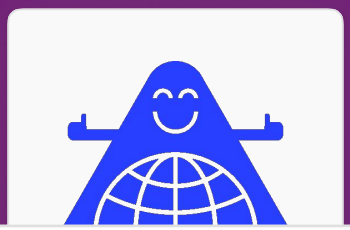
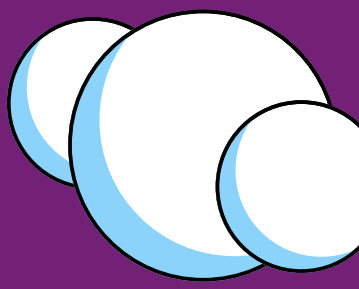
Responsible AI in Sustainability Management

SWEEP

GUIDE





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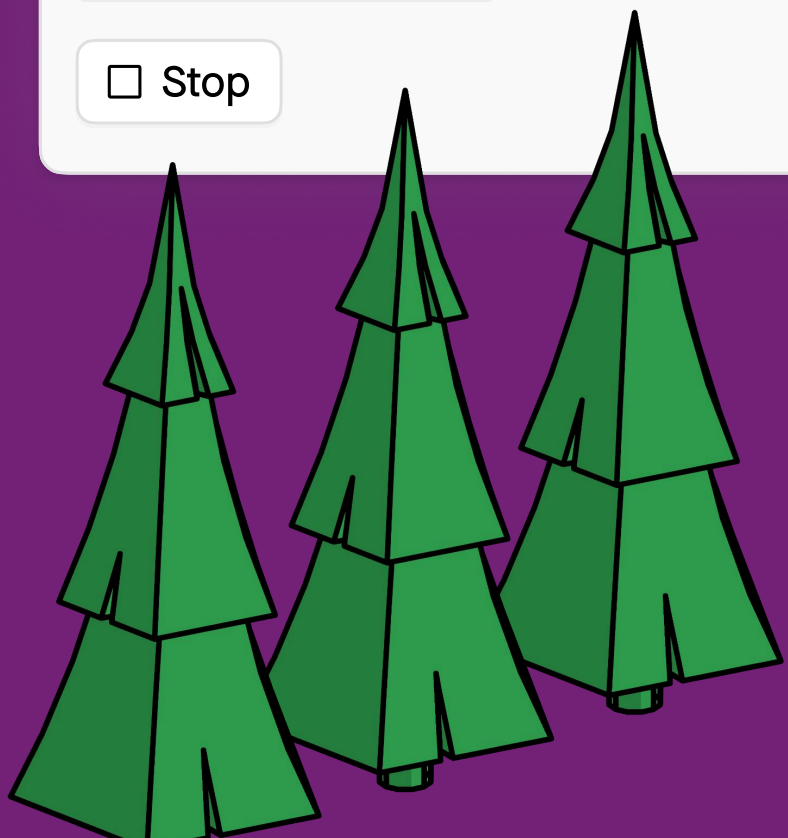

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Introduction

"AI manages the volume and complexity of sustainability data, so teams can focus on analysis, risk, and action."

Yannick Chaze
Cofounder & CTO, Sweep

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Artificial intelligence is now embedded in nearly every part of modern business, from operations to customer experience to sustainability. But as AI adoption accelerates, so does the environmental cost of running it.

Recent research shows that today's AI systems demand significant electricity, large volumes of cooling water, and rapid cycles of energy-intensive hardware. The infrastructure powering the AI boom is not yet built for a low-carbon world.

This creates a practical challenge for sustainability leaders.

On one hand, **ESG has become a data problem, and AI is increasingly essential to solving it.** Regulations like California SB-253 require accurate, auditable, continuous emissions reporting across complex value chains. Manual work and scattered tools can't keep up with the volume and granularity of data required.

On the other hand, using AI everywhere simply because it's available is neither efficient nor responsible - and, increasingly, nor physically feasible. Large, general-purpose models carry a heavy environmental footprint, and with AI compute becoming a scarce resource, not everyone will have access to it. What we need is a more intentional approach: AI that is precise, efficient, and designed for specific tasks rather than deployed by default.

This is the principle behind targeted AI: focused systems that deliver impact with minimal computational cost, while keeping users in control of their data. As Marie Ekeland, CEO of 2050, reminds us, AI's resource demands mean businesses must ensure its overall effect remains positive.

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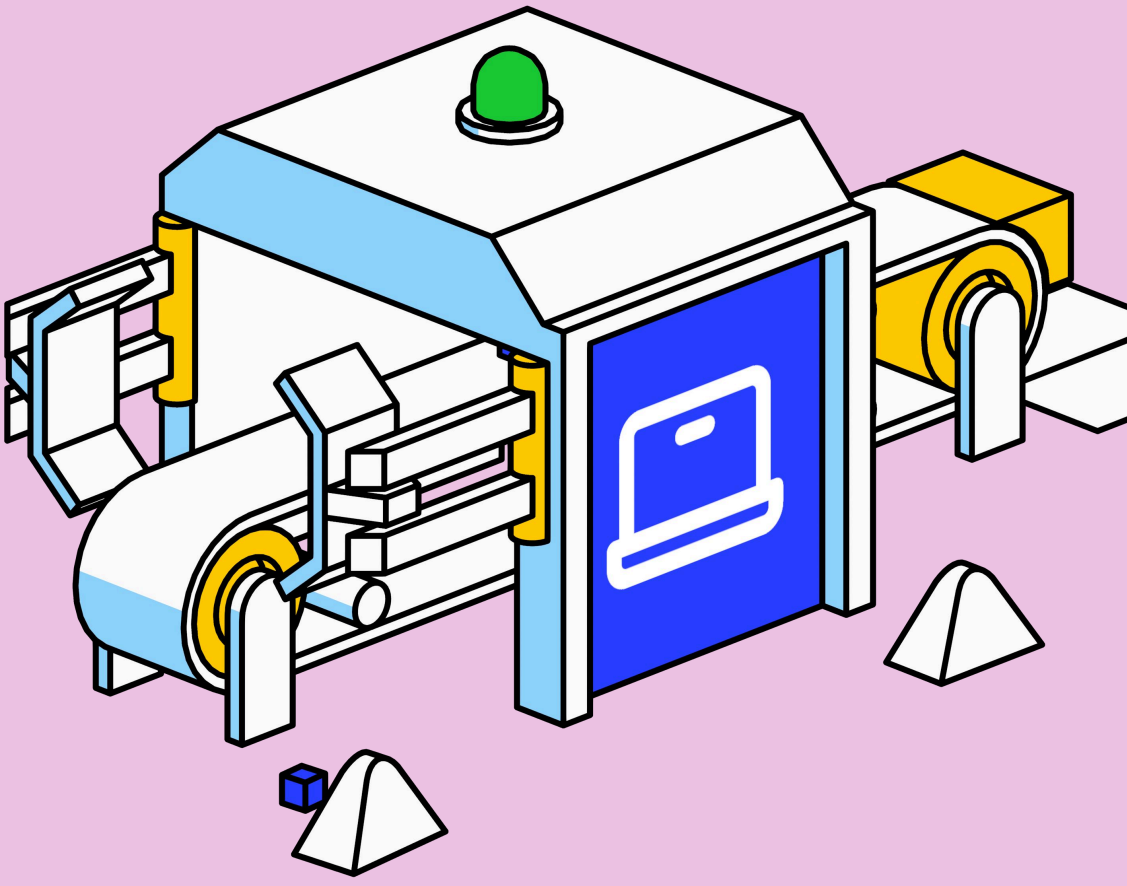

01 The environmental footprint of AI today

The conversation about AI's energy use tends to swing between extremes. On one side, researchers like Mahmut Kandemir at Penn State warn that AI's rapid growth could drive significant increases in electricity consumption, water use, and hardware demand. His work highlights very real risks: rising power loads in U.S. data centers, energy-intensive model training, and the strain that large-scale AI could place on global grids by the early 2030s.

On the other side, experts such as Hannah Ritchie, drawing on analysis from the International Energy Agency (IEA), urge caution against overreaction. Today's data centers, including AI workloads, make up roughly 1–2% of global electricity demand, and efficiency improvements in chips and infrastructure have historically kept energy growth far below what early forecasts predicted. Ritchie's message is clear: AI's footprint is growing, but many public figures are misinterpreted or taken out of context, often sounding more dramatic than they truly are.

Taken together, these perspectives tell a more complete story:

- **AI's environmental impact is real, rising, and increasingly visible in certain regions and grid hotspots.**
- Projected demand is expected to outpace the physical capacity to deliver both energy and water infrastructure, **meaning supply constraints will become the real limiting factor** – often referred to as the 'physical wall of AI.'
- **The risk lies not in panic, but in complacency.** Energy demand will increase, and without intentional action, AI could work against the sustainability goals it aims to support.

In other words: the footprint matters, and it's growing, but what matters most is how we design, deploy, and govern AI from here.

Built for sustainability leaders, by sustainability experts

Our AI is all substance. Every feature saves time, reduces errors, or improves decision-making.

"The real constraint facing AI isn't algorithmic, it's physical. Projected demand is already on a collision course with the infrastructure capacity needed to deliver the energy and water that powers it. Without intentional investment and governance, that wall will stop us long before the technology does."

Yannick Chaze
Cofounder & CTO, Sweep

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Research from Penn State

Why AI uses so much energy

Mahmut Kandemir, Penn State University, 2025.

Penn State's Mahmut Kandemir warns that AI's rapid expansion is creating a fast-growing environmental footprint, driven by soaring electricity use, water demand and hardware churn.

Key findings:

- **U.S. data centers used 4.4% of national electricity in 2023,** and this could **triple by 2028.**
- **Training large AI models is one of the most energy-intensive tasks in modern computing,** requiring thousands of GPUs or TPUs running continuously for weeks or months.
- By **2030–2035**, data centers of all kinds could consume **up to 20% of global electricity**, creating major strain on power grids.
- AI also drives **high water consumption, short hardware life cycles,** and rising e-waste, while chip manufacturing accelerates the extraction of rare earth minerals.

What needs to change, according to Kandemir:

- Develop leaner, more efficient AI model architectures.
- Invest in greener hardware, including next-generation accelerators.
- Shift data centers toward renewable energy, with better storage and infrastructure.
- Use smart global scheduling to align compute loads with times of peak renewable availability.

Read the full piece →

Research from data scientist Hannah Ritchie

AI's environmental footprint in context

Hannah Ritchie, author of Sustainability by Numbers.

Hannah Ritchie argues that while AI does create a real and growing environmental impact, much of the public conversation lacks context. She emphasizes that AI's footprint must be taken seriously, but understood accurately; neither minimized nor exaggerated.

Key findings:

- Data centers, including those dedicated to AI, currently use around 1–2% of global electricity, a small share for now but one that is expected to rise.
- Efficiency gains in chips and infrastructure have historically kept digital technologies from driving runaway resource use, but these gains may **struggle to keep up** with rapid AI scaling.
- Environmental impacts are often highly localized, with regions like parts of the U.S. and Ireland already experiencing **significant grid pressure from concentrated data center growth.** In some areas, this extends beyond energy, with water being diverted from food production to support data center cooling and manufacturing needs.
- A major barrier to understanding AI's real footprint is **poor transparency** from tech companies on actual energy, water, and hardware usage.

What needs to change, according to Ritchie:

- Much **better reporting** from companies on AI energy and water consumption.
- Continued focus on **efficiency improvements** in hardware and data center operations.
- A more **measured public discussion** grounded in reliable data, rather than headline-driven speculation.
- Policy and industry collaboration to track AI's footprint and ensure growth aligns with broader sustainability goals.

Read the full piece →

02 How AI accelerates sustainability management

Sustainability teams are under increasing pressure to provide accurate, auditable, and timely environmental data. This doesn't mean that AI replaces sustainability expertise or becomes a prerequisite for credible reporting. Rather, AI acts as a powerful **accelerator**: it strengthens data quality, removes inefficiencies, and frees up human teams to focus on strategy and decision-making. In a landscape defined by regulatory complexity and rising expectations, AI enhances sustainability management by making it faster, more precise, and more scalable.

2.1 Sustainability as a data and systems challenge

Modern sustainability work is ultimately a **data problem**. Organizations today must collect, reconcile, and report information across thousands of activities, suppliers, and business units, often using systems that were never designed for the task.

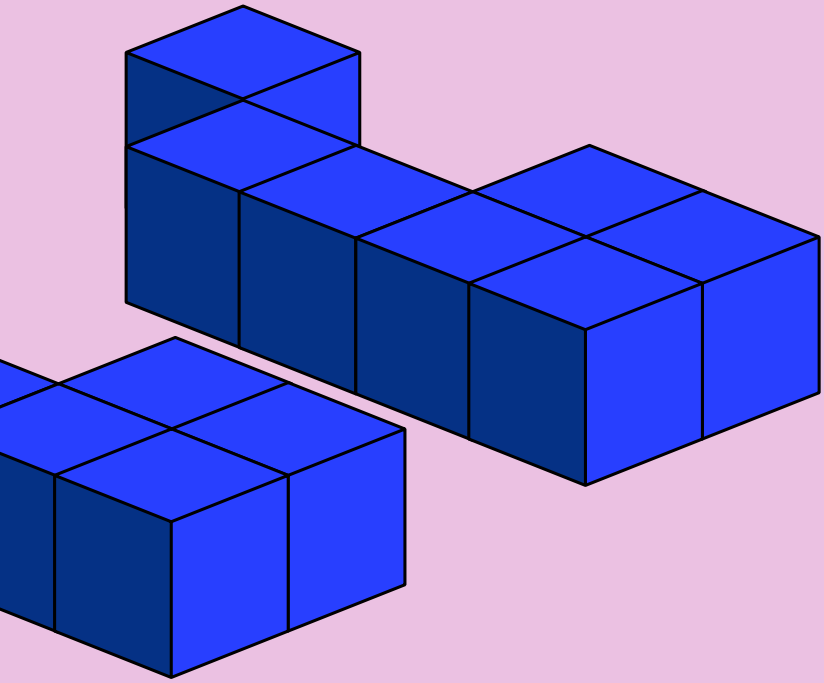
Three challenges stand out:

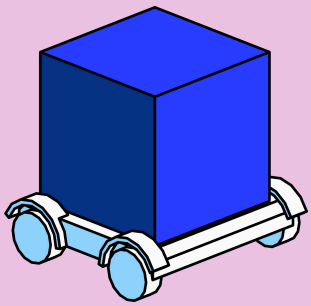
- **Fragmented data sources and inconsistent formats.** Emissions data lives in ERPs (enterprise resource planning systems), procurement tools, spreadsheets, emails, supplier portals, and external systems — with little standardization across them.
- **Increasing regulatory pressure.** Laws like California SB-253, the CSRD, and other investor-grade reporting regimes require granular, audit-ready disclosures across supply chains, often spanning Scopes 1–3.
- **The shift from annual to continuous reporting.** Regulators, investors, and customers expect real-time or near-real-time insights, not once-a-year summaries. Legacy tools built around static reports cannot keep pace with evolving requirements.

The result is that sustainability teams spend disproportionate time wrangling data, rather than analyzing or acting on it. This is where AI provides meaningful lift: not by replacing expertise, but by enabling teams to manage complexity at scale.

Introducing Sweepy

Sweepy is your assistant to get everything done faster, more effectively, and with more confidence. Gain instant insights, create dashboards in minutes, and effortlessly navigate the Sweep platform.





“AI doesn’t replace sustainability expertise – it amplifies it. Its real value is in managing volume, complexity, and change across massive datasets. That’s what allows teams to focus on analysis, risk, and action instead of data wrangling.”

Karen Veldeman
Associate Director, Product Management

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2.2 Where humans struggle and AI excels

AI offers the greatest value when it tackles the tasks that make sustainability work slow, tedious, or error-prone:

- **High-volume, repetitive data handling**
  AI can automate ingestion, classification, and transformation of large, heterogeneous datasets, work that would otherwise consume countless hours.
- **Cleaning and mapping decentralised data**
  Machine learning models can identify inconsistencies, reconcile units of measurement or formats, and align data to reporting frameworks far more reliably than manual processes.
- **Spotting patterns and anomalies**
  Across thousands of data points, AI can flag unexpected trends, missing information, or outliers that humans may overlook under time pressure.
- **Supporting scenario analysis and risk detection**
  AI enhances human judgment by surfacing risks (e.g., suppliers' greenhouse gas emissions hotspots, unusual emissions trends) and enabling faster scenario modeling.

The goal is not to automate sustainability programs, but to **automate the plumbing**, allowing people to focus on strategy, governance, and decarbonization.

03 Responsible AI in Sustainability Management

As sustainability management platforms evolve, AI is increasingly being built into the tools that collect, organize, and analyze carbon and ESG data. This creates new opportunities for speed and accuracy, but also new responsibilities. The aim is to ensure that AI features embedded in these systems genuinely support climate goals without introducing unnecessary environmental or ethical risks.

Responsible AI in sustainability management tools should be guided by the following principles.

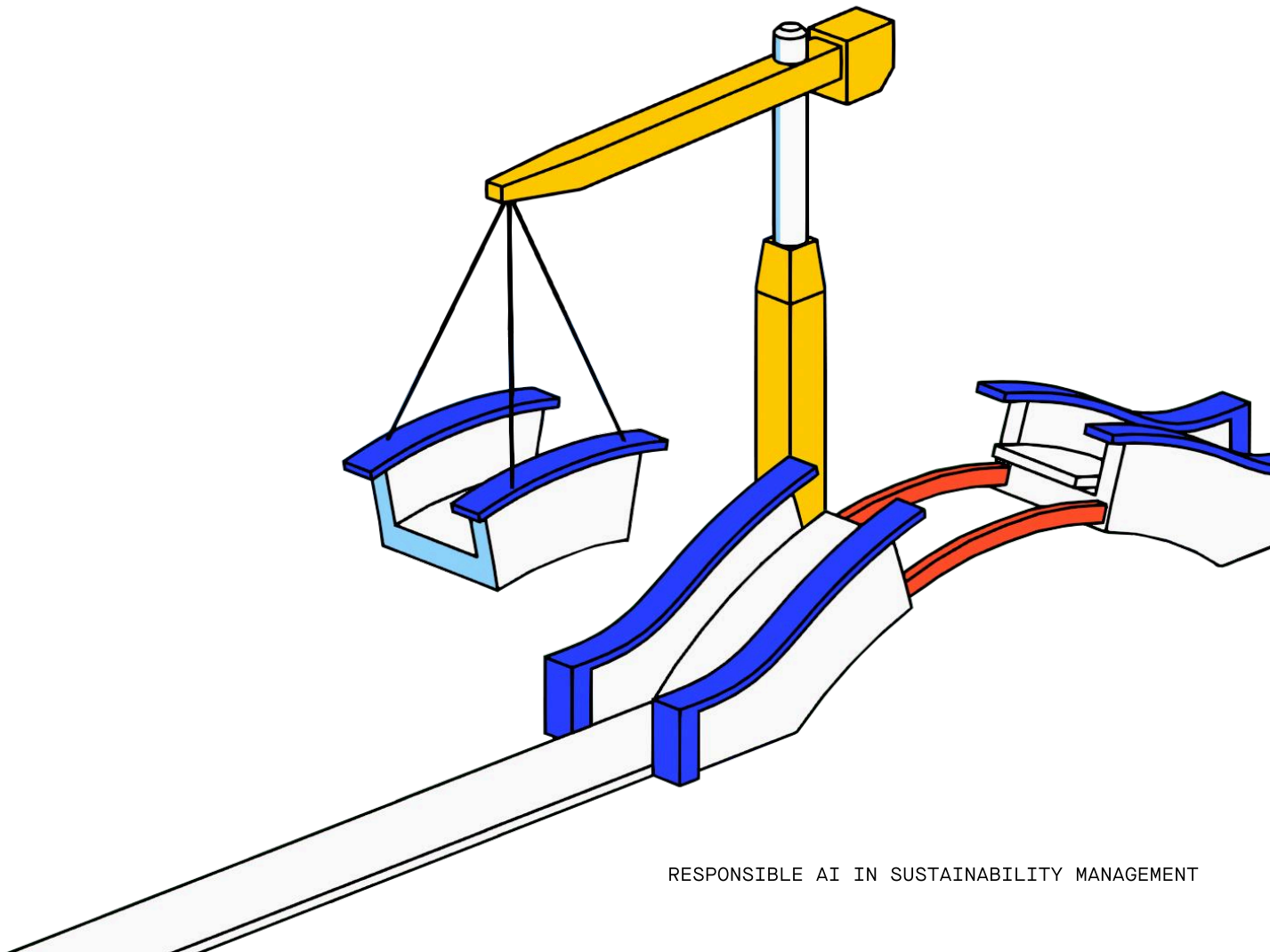
3.1 Use AI only where it strengthens the workflow

AI should be applied selectively, enhancing the parts of sustainability management that benefit most from automation — and nowhere else.

Effective use cases include:

- cleaning and standardizing incoming data
- detecting gaps, inconsistencies, or anomalies
- mapping information to reporting formats
- supporting scenario and risk exploration

These tasks are high-volume and rule-based, making them suitable for targeted automation. Strategic decisions, interpretation, and prioritization must remain human-led.



“We don’t use AI everywhere in Sweep, only where it measurably improves accuracy, consistency, and scale. Tasks that are repetitive and rules-driven are automated, while interpretation and decision-making stay with people. That separation is essential for audit-ready sustainability data.”

Rachel Delacour
CEO of Sweep

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3.2 Keep human oversight at the center

Sustainability data sits at the intersection of compliance, strategy, and external reporting. For that reason, users must remain firmly in control.

Responsible platforms ensure:

- transparency around how AI-generated outputs are produced
- clear human review steps for important decisions
- documentation of assumptions and model boundaries
- the ability to override or correct AI suggestions

AI should support users, not replace their judgment or accountability.

3.3 Build for transparency, auditability, and trust

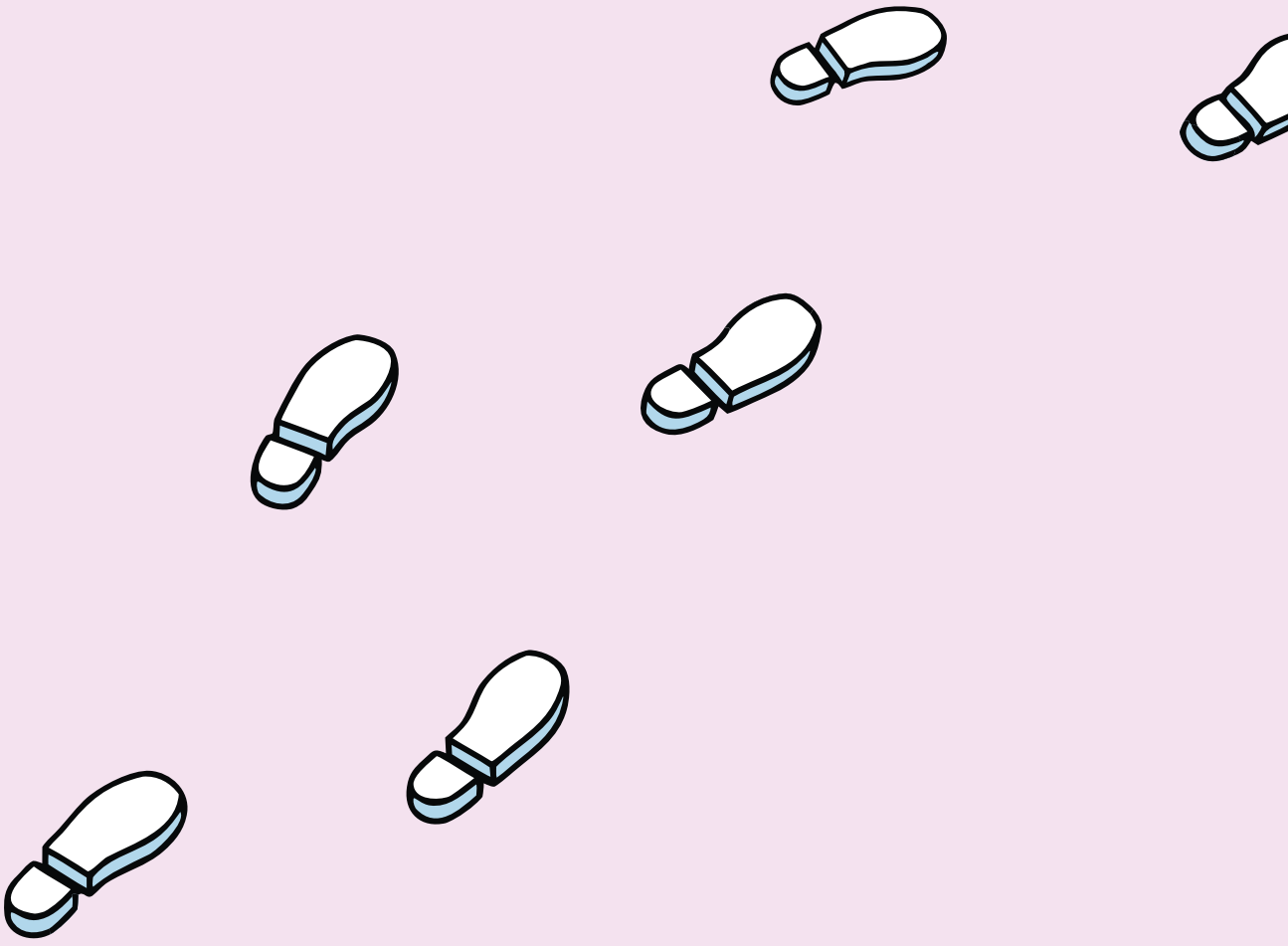
Sustainability data now feeds into financial disclosures, regulatory filings, and investor reporting. AI features must therefore be explainable and auditable.

Good practice includes:

- clear summaries of how AI reached its recommendations
- repeatable outputs
- traceable data lineage
- alignment with existing reporting and assurance standards

This ensures AI strengthens credibility rather than undermining it.

04 Sweep in practice: measuring AI's environmental footprint



Sweep's AI LCA: Key findings at a glance

Sweep conducted a Life Cycle Assessment of its platform using ADEME's Product Category Rule for cloud services as the methodological foundation, covering its cloud infrastructure (Amazon Web Services and Snowflake).

Two metrics were defined:

Sweep Platform Use

0.00015 kg CO_2e
per measurement

Sweepy AI Usage

0.013 kg CO_2e
per credit

What this means in practice:

- Customers can now account for Sweep's platform in their own value chain emissions reporting, specifically within purchased software.
- The Sweepy credit metric enables users to understand the environmental cost of their AI-assisted workflows and benchmark against other AI tools.
- The results provide a documented, repeatable baseline — part of Sweep's commitment to practising the same rigour in measuring its own footprint that it enables for its customers.
- Sweep has already identified the primary lever for reducing its footprint: infrastructure configuration decisions such as cloud region, service selection, and query optimization.

This study is part of Sweep's broader commitment to transparency. Future iterations will expand the scope further, including engagement with a third-party reviewer to strengthen credibility.

Read the full piece →

05 Shaping a smarter, lighter future for AI in sustainability

AI now plays an important role in the systems that support climate and ESG work, but its growth comes with real environmental considerations. The challenge is to harness the efficiency and clarity AI offers without adopting models or infrastructure that introduce unnecessary cost or complexity. A targeted, transparent approach allows sustainability teams to benefit from automation where it matters most, while keeping the technology's footprint proportionate to its value.

The organizations that will gain competitive advantage, and lead, are those that apply AI intentionally, choosing purpose-built tools and keeping human judgment at the center. This balance enables faster reporting, clearer insights, and stronger decision-making, while staying aligned with broader climate goals. It's not about using more AI, but about using it wisely.

“What saved me the most time in the first year was Sweepy, the AI assistant. We had to thoroughly revise a number of our responses from the previous year to complete narrative CSRD data points, and to provide more comprehensive, relevant, and better-organized information. Sweepy helped us a lot and saved us time.”

Sébastien Bernard
Corporate Sustainability & Risks Manager

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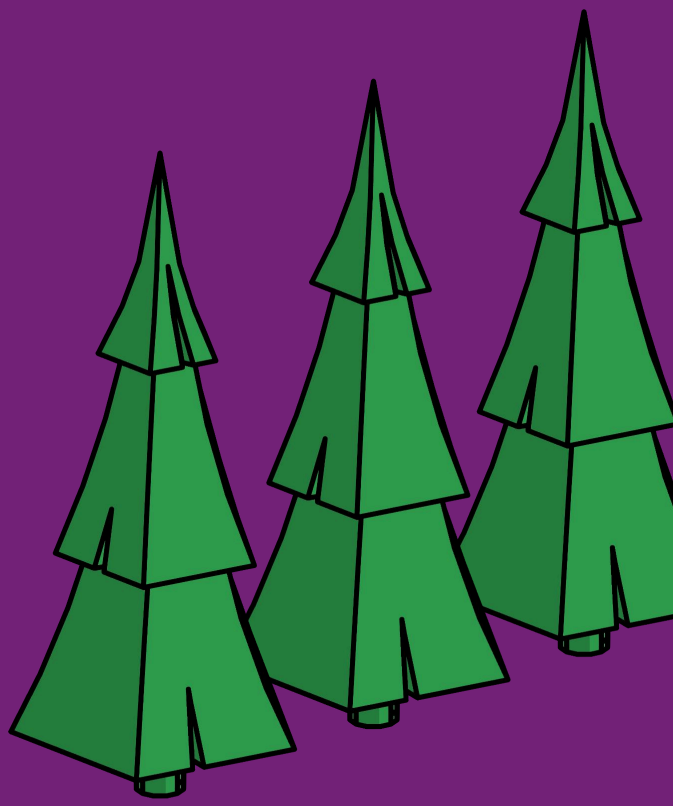

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