The world is how we shape it.

AI & ENVIRONMENT: CLEARING *THE INFORMATION FOG*

REPORT - JUNE 2025

sopra steria

Axelle Lemaire

Executive Director, Sustainability and Corporate Social Responsibility, ***Sopra Steria***

We can no longer turn *a blind eye*

FOREWORD

Ten years ago, the Paris Agreement represented a milestone of shared ambition. Today it appears weakened as new challenges emerge: cascading geopolitical upheavals are are destabilising our democracies, **the European Union is backtracking on the Green Deal, and the scientific consensus is being undermined amid a global battle of competing narratives.** Added to this for nearly three years now has been the massive adoption of generative artificial intelligence.

This technological revolution is embedded in an imagination shaped by powerful narratives (promises of efficiency, unlimited progress, even technological salvation) which often obscure the materiality of its impacts and contribute to a form of collective blindness.

This ethereal vision persists in a sector that has long minimised its ecological footprint. Yet the figures bring us back to reality: according to an IEA study, the electricity consumption of data centres rose from 300-380 TWh in 2023 to 415 TWh in 2024, with a projection of 945 TWh by 2030, notably due to the explosion in uses linked to artificial intelligence.

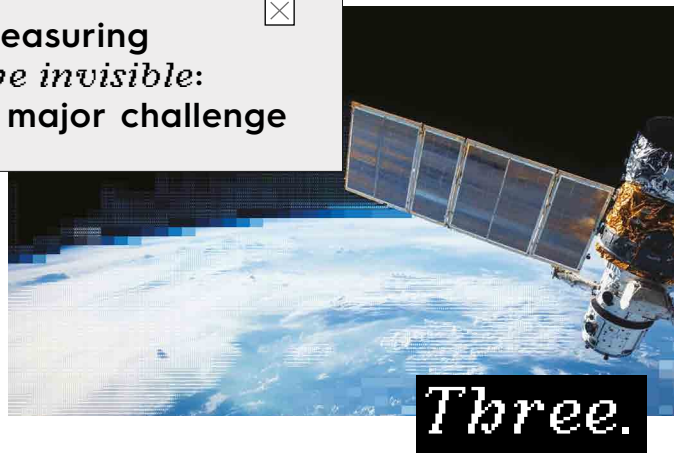
Faced with this situation, we should ask ourselves: why AI, for what uses and with what environmental impact? The challenge is twofold: to measure this impact precisely with transparent methods and to transform AI into a lever for ecological transition rather than a burden. As I like to remind people, to implement, you must measure. And to measure, you need data. In this context, our responsibility is to demonstrate through evidence that despite political fluctuations and in the face of tensions of all kinds, action endures. This study aims precisely to clear the informational fog that surrounds AI and its environmental impact.

The goal? To establish common foundations to work together towards responsible artificial intelligence.

Invisible impact, *siloed* opinions

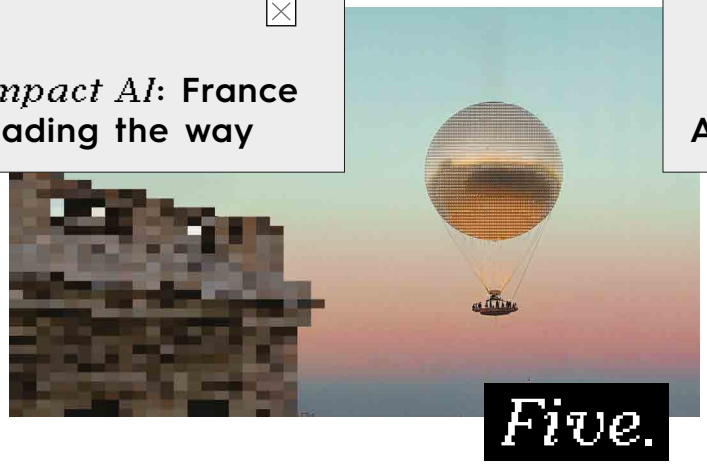
Communication breakdown: when "misinfo" *clouds the issue*

Measuring *the invisible*: a major challenge

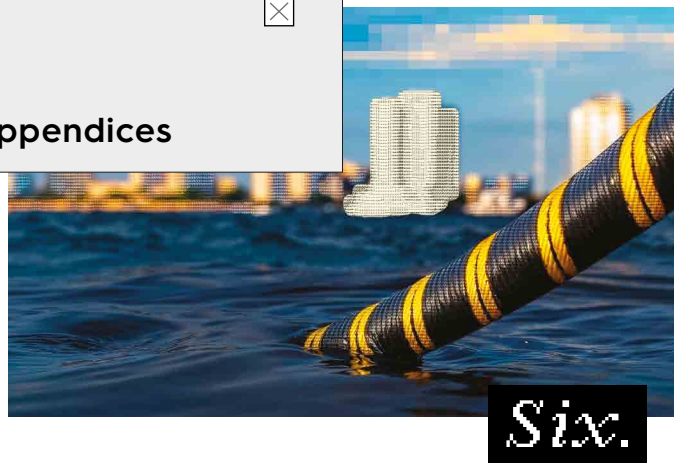


No miracles: tools, standards and innovative projects

Impact AI: France leading the way



Appendices



Testimonials:

David Chavalarias (Research Director, CNRS), **Hugues Ferrebœuf** (Digital Project Director, The Shift Project), **Juliette Fropier** (AI Project Manager, Ministry of Ecological Transition), **Laetitia Gazagnes** (Executive Director, Impuls'Innov), **François Gemenne** (Co-author of the sixth IPCC report), **Axelle Lemaire** (Executive Director of Sustainable Performance, Sopra Steria), **Eva Morel** (Co-founder of Quota Climat), **Yves Nicolas** (AI group Program Director - Deputy Group CTO, Sopra Steria), **Sarah Oury** (AI Developer, Sopra Steria), **Joëlle Pineau** (Researcher and Associate Professor at McGill University School of Computer Science), **Samuel Rincé** (President & Co-founder of GenAI Impact), **Mathieu Welhoff** ((Head of Digital Sobriety Service, ADEME), **Bernard Yannou** (Deputy Research Director, Centrale SupElec)

Press:

Opsci.ai - 21,970 articles mentioning the expressions **« intelligence artificielle, "intelligence artificielle", "artificial intelligence" and "climate", "climat" or "environnement" and "environnemental"** collected from 614 media sites between 1 January 2024 and 30 April 2025.

Social Media Data:

(collected and analysed by Opsci.ai)

AI Conversations [•]
802,465 messages posted on X and LinkedIn between 1 January 2024 and 30 April 2025

AI Leaders [•]
34,372 messages posted on X and LinkedIn between 1 January 2024 and 30 April 2025

Climate activists and scientists [•]
314,419 LinkedIn publications from a panel of 5,000 climate activists and scientists between 1 January 2024 and 30 April 2025

ChangeNOW [•]
Queries for "ChangeNOW", "ChangeNOW2025" and "#ChangeNOW" on X and LinkedIn between April and May 2025

Starter Pack [•]
Queries for "Starter Pack", "#starterpack" and "starterpack" on X and LinkedIn between April and May 2025

Studies and Research:

- France's strategic roadmap for artificial intelligence **(DGE)**
- Energy and AI **(IEA, April 2025)**
- Artificial intelligence, data, calculations: what infrastructure in a decarbonised world? **(The Shift Project, mars 2025)**
- Hype, Sustainability, and the Price of the Bigger-is-Better Paradigm in AI **(Gaël Varoquaux, Alexandra Sasha Luccioni, Meredith Whittaker, March 2025)**
- Social representations of climate change **(ADEME, October 2024)**
- People and Climate Change 2025 **(IPSOS, April 2025)**
- Global Study Finds Trust of Climate Scientists Split Across Political Spectrum **(Columbia University, April 2025)**
- Disinformation in January suggests that the EU overturns national elections **(EDMO, 17 February 2025)**

INVISIBLE IMPACT, *SILOED* OPINIONS

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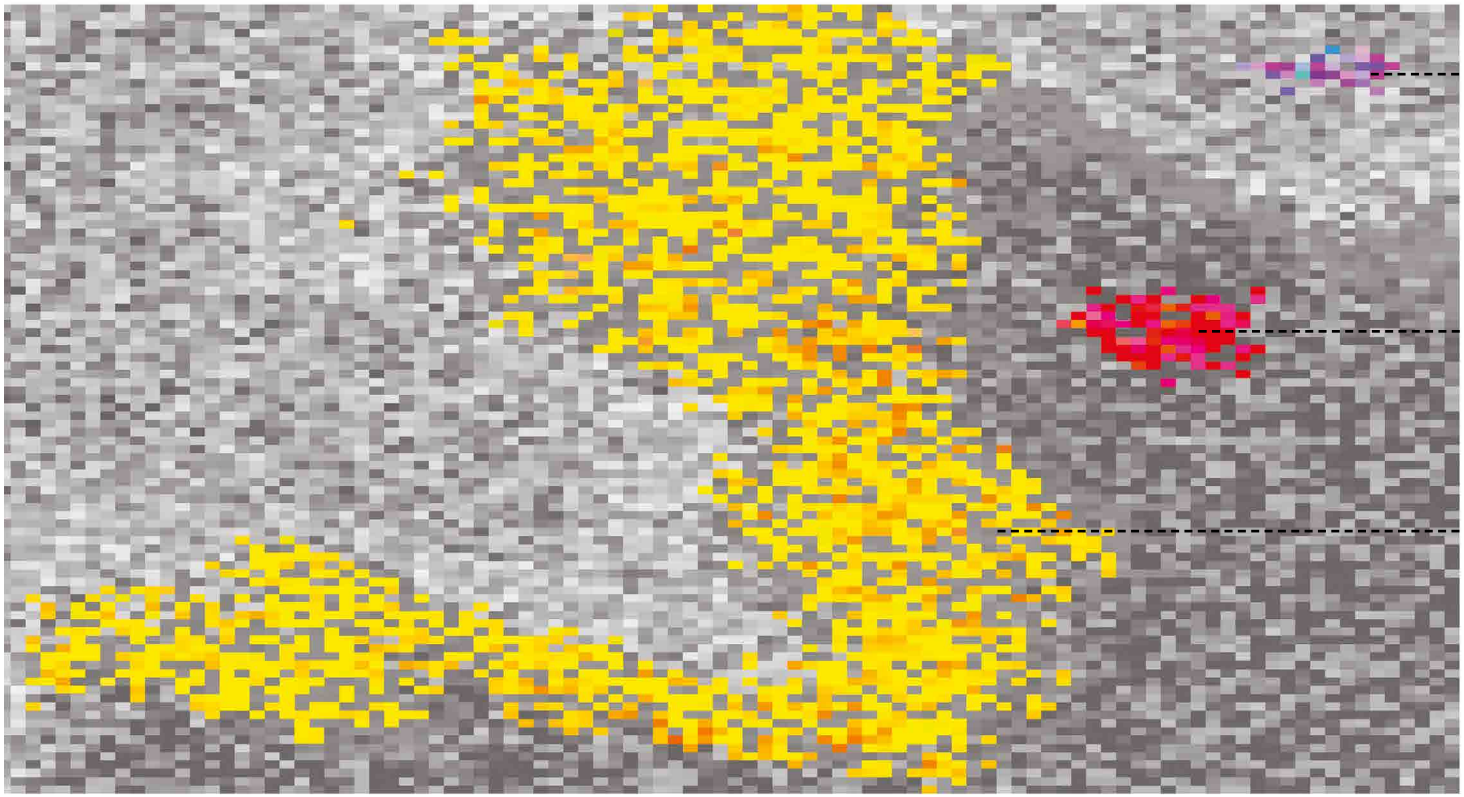
Environmental impact: *the invisible* in the global *conversation about AI*

Across platforms such as LinkedIn and X, references to "artificial intelligence" or "AI" focus little on the environmental impact of this technology.



Only 0.56%
of posts mentioning AI since 1st January 2024 have been devoted **to its environmental impact**

3 times less
than crypto **(1.6%)**

24 times less
than news about generative AI models **(13.6%)**

Analysis conducted on the global AI conversation from 802,465 messages posted on X and LinkedIn between 1st January 2024 and 30e April 2025.

And for *those who create AI?*

AI's carbon footprint is not a priority on the Tech leaders' agenda

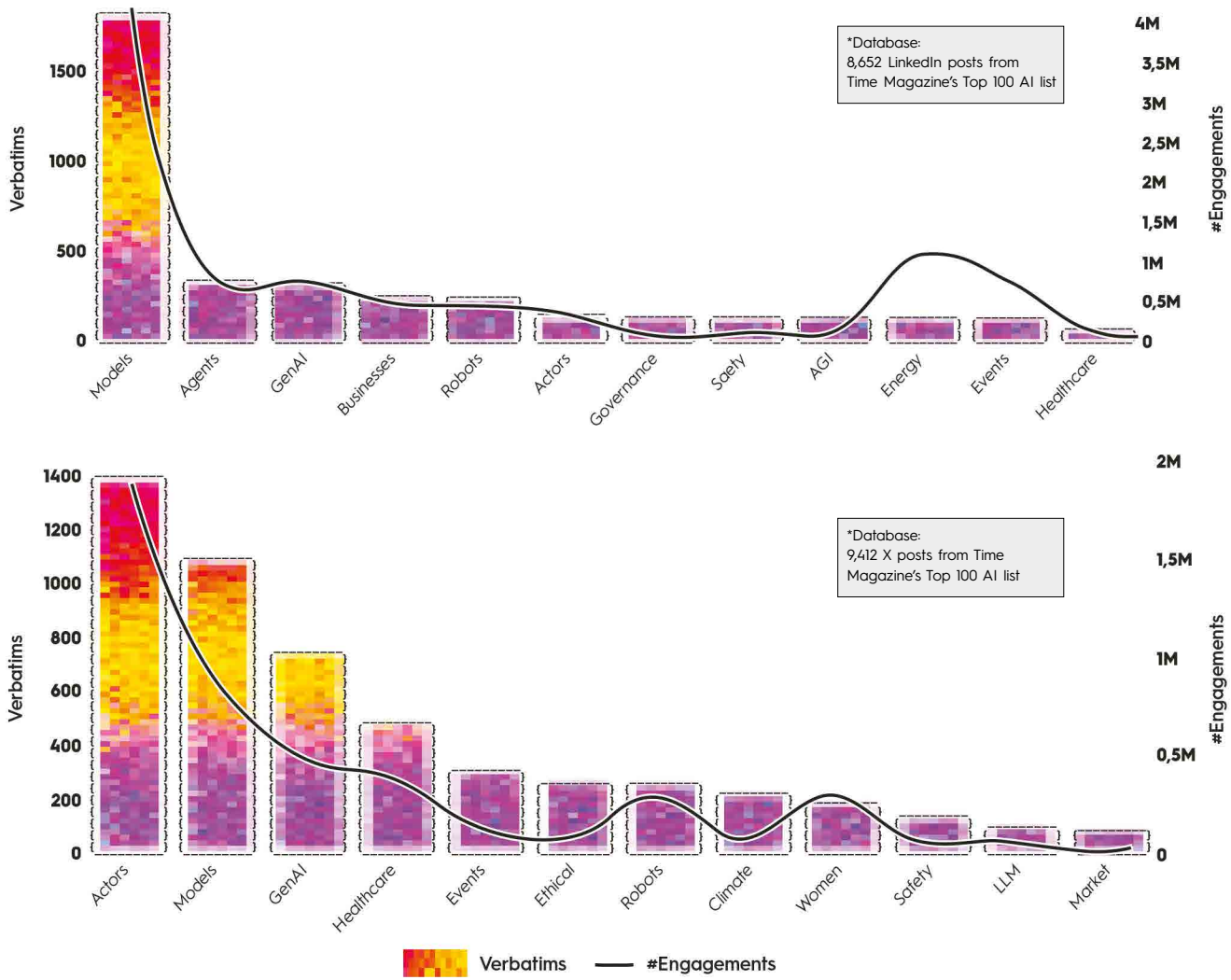
For the 100 AI leaders identified by Time Magazine, the environmental impact is a secondary subject.

The climate issue is relegated to 8th place among the most discussed topics by emblematic figures such as Sundar Pichai, Sam Altman, Satya Nadella, Mark Zuckerberg or Jensen Huang.

We find questions related to AI's environmental impact just after those related to robotics and very far behind debates about models or news from sector players.

On X, when members of the same panel share posts devoted to energy issues, **reactions explode (745.2K engagements).**

The analysis nevertheless shows that the conversation mainly revolves around energy issues. **But most debates focus on the question of how to obtain more energy at lower cost, in order to run models and supply data centres.**



And in *eco-friendly* spheres?

Little room for AI in exchanges about ecological transition

The analysis of 314,419 messages published on LinkedIn by figures in the fight against climate change indicates that only 2.85% of published messages concern artificial intelligence. Its development is predominantly presented as an energy-hungry threat.

**Database: 314,419 LinkedIn posts from a climate-focused panel explicitly referencing AI over the period under review.

HTTPS://WWW.CHANGENOW.WORLD/AI-FOR-IMPACT/

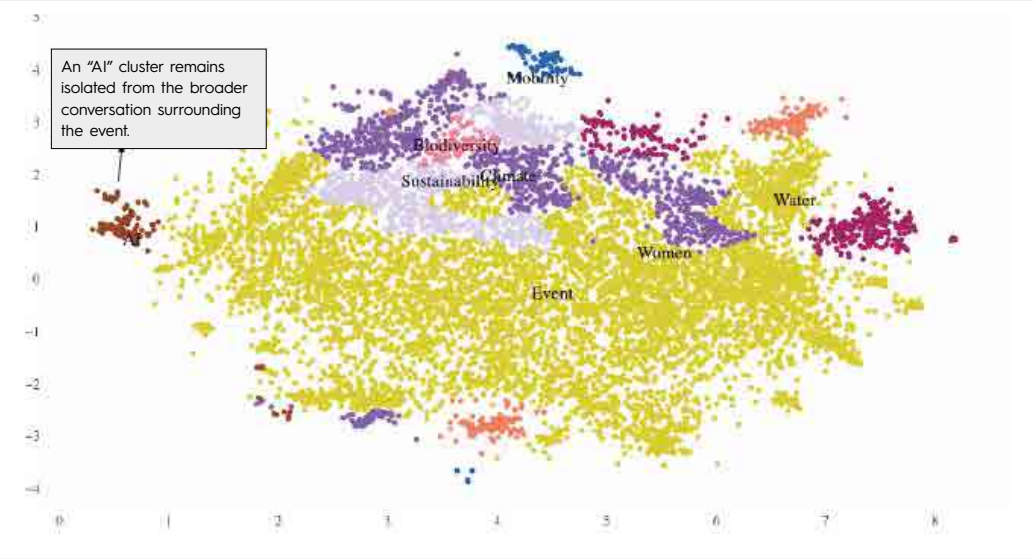
CASE STUDY

To concretely measure this disconnection between AI experts and climate activists, we analysed the place that technology occupies in exchanges around **ChangeNOW**, the international event dedicated to environmental solutions. The results confirm our hypothesis.

Of the 5,312 messages posted on LinkedIn, only **2.6% mentioned artificial intelligence, confined to the margins** (see graph).

The general conversation around the event has very little focus on AI, yet it was positioned as a central theme of the event.

Among these discussions, two dominant narratives emerge.
The first advocates for the mobilisation of AI as a tool to reduce global warming or mitigate its consequences.
The second underscores the imperative of advancing data transparency and promoting more restrained, resource-conscious use of technology.



In the *media* ?

Media coverage remains marginal and largely favourable towards the tech

Between January 2024 and April 2025, **21,970 press articles addressed the links between AI and the environment – representing barely 2.4% of all AI-related coverage.** While the diversity of perspectives reflects genuine interest, this remains a marginal topic within the broader discourse on artificial intelligence.

Across general interest press, magazines, and specialist publications, tone analysis reveals the primary areas of concern. Climate and energy issues are predominantly framed in a positive light, reinforcing a tech-friendly narrative regarding the environmental impact of artificial intelligence.

The Economist — *"How AI could help the climate. The technology could help decarbonise the industries that have proved the hardest to clean up"*

The New York Times — *"Will A.I. Ruin the Planet or Save the Planet ?"*

Les Echos — *"How AI aims to prevent the energy nightmare"*

Usbek & Rica — *AI helping the environment, it is possible*

21,970 articles from 2024 and 2025 collected from 171 media sites, categorized by AI into 19 main themes.

When investigative journalism addresses the subject

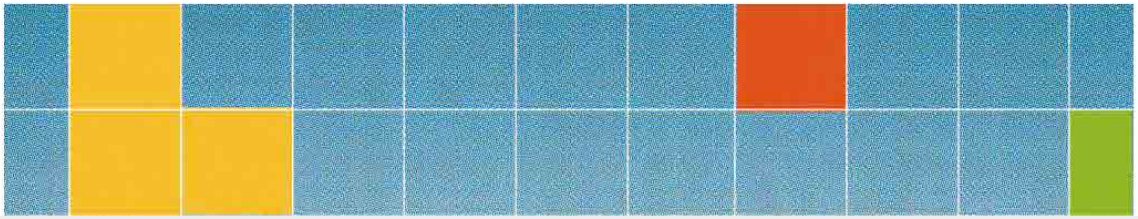
The information fog and the largely uncritical discourse may be challenged in the coming months, as investigation into the energy demands of generative AI models gain momentum.

HTTPS://WWW.THEGUARDIAN.COM/ENVIRONMENT/2025/APR/09/BIG-TECH-DATACENTRES-WATER

The Guardian

Eur

Revealed: Big tech's new datacentres will take water from the world's driest areas



The Guardian's recent investigation revealing that Amazon, Google, and Microsoft are building hundreds of data centres in some of the world's most arid regions — with 38 already operational and 24 more under development in areas facing severe water scarcity, highlights the true environmental cost of AI expansion and mounting tensions over water use with local communities.

HTTPS://WWW.LEMONDE.FR/LES-DECODEURS/ARTICLE/2025/06/08/POURQUOI-NOTRE...

Le Monde

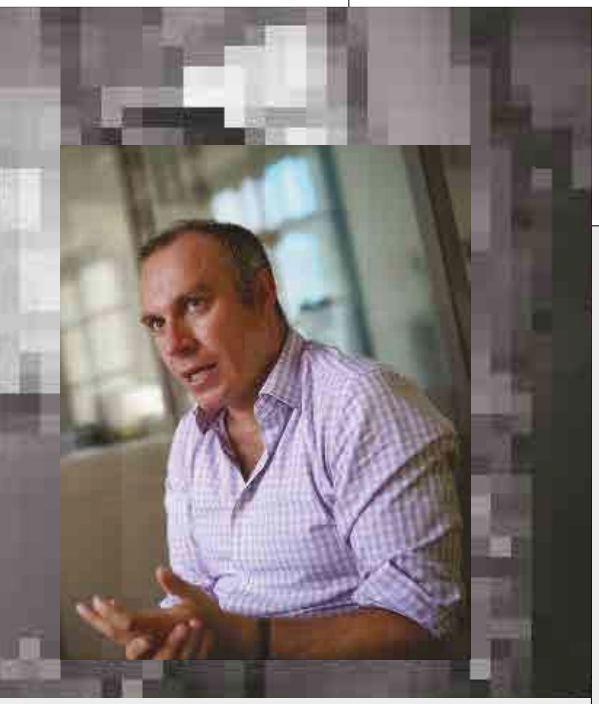
A simple question prompts an instant reply. Yet behind the scenes, a complex computational system is set in motion — all at the cost of very real energy consumption. Our brief interaction with AI consumed 0.363Wh of electricity, equivalent to nearly 2% of a smartphone's battery.

Marie Curie received the Nobel Prize twice. She first received the Nobel Prize in Physics in 1903, in collaboration with her husband Pierre Curie and Henri Becquerel, for their work on radioactivity. Subsequently, she received the Nobel Prize in Chemistry in 1911 for her discoveries of radium and polonium.

Énergie: **0,363 Wh** | ≈ **1,91%** d'une charge de téléphone (19Wh)

In an animated article from its "Les Décodeurs" section, *Le Monde* clarified the subject of generative AI energy consumption, from model design to its use.

COMMUNICATION BREAKDOWN: WHEN "MISINFO" *CLOUDS THE ISSUE*



François Gemenne

Co-author of the sixth *IPCC report*

A "*largely ideological*" debate

People realise that the ecological cost of generative AI is a real issue, but they have superficial knowledge of it. **Current debates suffer from excessive** polarisation that artificially opposes solutions to each other. We should rather identify their complementarities and understand how technological advances can favour behavioural evolution.

The problem is **that public discussion on these subjects has become largely ideological:** everyone seeks above all to speak to their own camp. I note in this regard a worrying rise, in certain ecological circles, of systematic hostility towards technology.

We tend to oppose technological solutions and environmental behavioural changes, whereas in reality, our usage evolutions are often made possible by technology: mobility applications that make us abandon cars, GPS that optimise our journeys, connected thermostats that reduce our energy consumption...

However, it is not enough to rely on technological optimisations: we must tackle the real levers of change. Especially since the big black spot remains the energy consumption of these tools. The challenge consists of overcoming this camp logic **to build hybrid approaches that combine technological innovation and usage transformation.**

Starter packs: awareness meets outrage

In early April 2025, starter packs — images depicting personalised figurines encased in plastic-style packaging — rapidly circulated across social media platforms, driven by the ease with which such content could be generated using artificial intelligence tools.

On this occasion, the debate momentarily broke through the prevailing informational fog, spurred by the dissemination of evidence-based critiques drawing on published research:

- "Energy consumption per image: approximately 0.1 to 0.4 kWh for a single generation."
- "0.4 kWh equates to roughly one hour of dishwasher use."
- **"Each starter pack consumes as much electricity as a full smartphone charge."**

*Hype, Sustainability, and the Price of the Bigger-is-Better Paradigm in AI Gaël Varoquaux, Alexandra Sasha Luccioni, Meredith Whittaker.

HTTPS://WWW.LINKEDIN.COM/POSTS/TP STARTERPACK-CHATGPT

Recherche

Vous

Thomas Pesquet • Abonné
Astronaute, pilote, ingénieur, explorateur, auteur.
Accéder à mon site web
2 mois • Modifié •

Somebody made my Starter Pack...
We've all seen this fun trend pop up on our feeds.
Thanks to generative AI, we can now create a figurine in our likeness with just one click. It's impressive, and a bit intoxicating, let's be honest.
But behind the magic, there's a reality we often forget to look at: the environmental cost of these technologies.
According to the International Energy Agency, boosted by AI, global electricity demand for data centers should more than double by 2030.
It's not about rejecting everything wholesale but it's essential to integrate education about the environmental impact of digital technology into our usage.
AI is a wonderful tool... as long as we understand what it mobilizes behind the scenes.
It's up to all of us - citizens, engineers, creators and decision-makers - to pave the way for more responsible tech.
As for myself, I prefer original creations by artists, like Enki Bilal, Romain Hugault, or Marion Montaigne, to name just those who have drawn me at some point!
We've all seen this fun trend pop up on our feeds. It's wild to create something like this in just one click. But here's the thing: AI-powered tools consume a LOT of energy. According to the IEA, electricity demand for data centers could more than double by 2030. As for myself I prefer the work of real artists, swipe to check Enki Bilal and Romain Hugault.**

#starterpack #chatgpt #ai

In response to this debate, four distinct groups emerged, shaping the conversation:

The amazed — captivated by the quality of the AI-generated images. The enthusiastic helpers — focused on fostering engagement by sharing tips and tutorials to optimise prompts.

The critics — expressing concern over the mass adoption of AI and its environmental cost.

The metacritics — rejecting environmental arguments, claiming they reflect a form of class disdain. In their view, digital elites invoke ecological concerns as a means to discredit ordinary users.

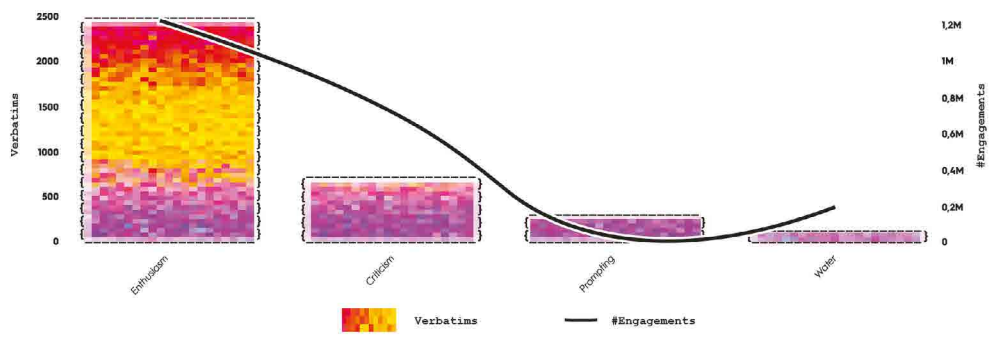
X & LinkedIn: *different platforms, different perspectives*

The starter pack phenomenon serves as a microcosm of the broader tensions surrounding artificial intelligence — highlighting the ongoing friction between mass adoption and the call for measured, responsible use.

On X, the conversation predominantly revolves around the enthusiastic sharing of starter pack images and advice on how to generate them effectively (excitement & prompting).

However, criticism has emerged, particularly around the water consumption required to produce these images. In total, **17.2% of the analysed posts criticised starter packs, with 2.4% specifically citing concerns about water usage associated with data centres.**

Note: the hashtag "Starterpacknoai", which brings together and promotes versions made by human artists, ranks second among the most used hashtags.

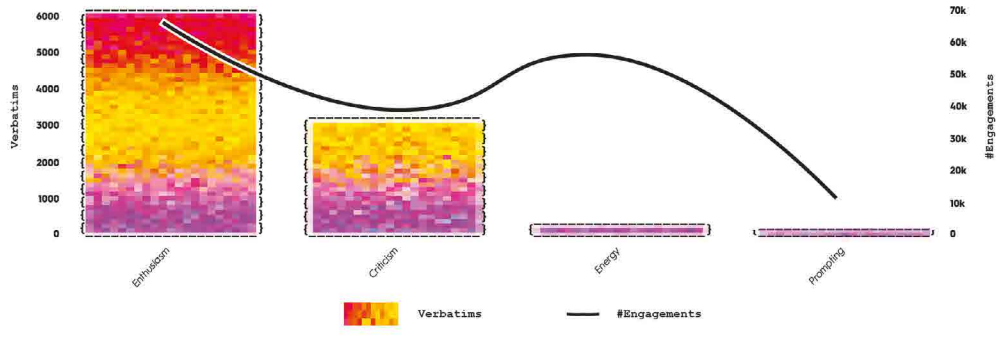


On LinkedIn, nearly one in three posts **(29.4%)** criticises starter packs.

Enthusiasts, although in the majority, receive less engagement (22.86% of total) than those criticising the trend (33.56% of total).

Critical posts highlighting the ecological cost of generating starter packs receive the highest level of interaction, representing 19.43% of total engagement.

This is largely driven by debates between advocates of unrestrained AI development and those defending environmental concerns.



Between *techno-solutionism and neo-Luddism,**, the battle of narratives

An in-depth analysis of data and conversations across the social networks under review reveals *a polarisation that is symptomatic of the broader debate* surrounding artificial intelligence and the environment.

Some promote AI's potential to accelerate scientific innovation, deliver productivity gains, reduce energy consumption, support the energy transition — particularly in the United States — while enhancing diagnostics and emissions monitoring on a large scale.

Others warn of its expanding carbon footprint, excessive water use, and an energy bill that often outweighs the benefits, leading to an unfavourable cost-benefit ratio for the climate.

Much of the debate focuses on direct impacts **— mineral supply chains, emissions from training large models,** water consumption, and the growing volume of electronic waste from hardware obsolescence.

This often sidelines more complex, indirect effects, including the rebound effect and the Jevons paradox, where efficiency improvements ultimately drive greater resource consumption.

Neo-Luddism is a school of thought that advocates withdrawing from modern technologies, including smartphones and social networks, in rejection of today's hyper-connected society. Neo-Luddites position themselves as the intellectual heirs of the 19th-century Luddites, who resisted the introduction of mechanised weaving in the textile industry.

The scientific community caught between *polarisation and disinformation*

Amid growing polarisation between technophiles and technophobes, the scientific community increasingly finds itself instrumentalised — when it is not entirely excluded from the conversation. This dynamic reflects a broader, global trend of rising distrust towards science.

1

Erosion of scientific consensus

- **33% of French**[1] people think that climate warming remains "a hypothesis on which scientists do not all agree" **(+6 points vs 2022)**
- **29% globally**[2] estimate there is no scientific consensus
- A global phenomenon of loss of confidence, accentuated in developed countries
- **"Post-industrial paradox":** the more technologically advanced a society becomes, the more a part of its population comes to view science as either unnecessary or suspect.

2

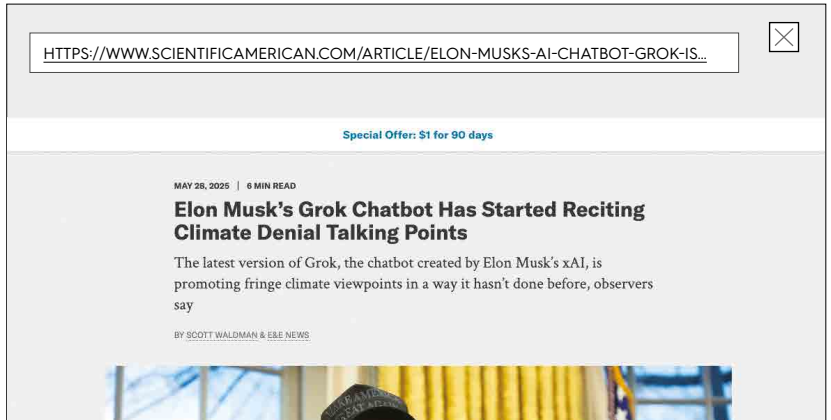
Politicisation of debates

- **In 22 of the 26 countries surveyed**[3], right-wing voters express less trust in climate scientists.
- Confidence levels vary — from **58%** in North America to **84%** in South Asia.

3

Amplification of disinformation

- **Climate is the #1 subject of disinformation in Europe**[4]
- **128 hoaxes** use generative AI to create misleading content
- **The Grok chatbot** (xAI/Elon Musk) slips climate-sceptic arguments into about **10% of its responses to climate-related questions.** *Unlike other mainstream AI, it is the first model to relay* anti-scientific narratives about climate at this scale.
- By facilitating the production and dissemination of false information, AI becomes a powerful engine of climate disinformation and participates in blurring public debate.


HTTPS://WWW.SCIENTIFICAMERICAN.COM/ARTICLE/ELON-MUSKS-AI-CHATBOT-GROK-IS...

Special Offer: $1 for 90 days

MAY 28, 2025 | 6 MIN READ

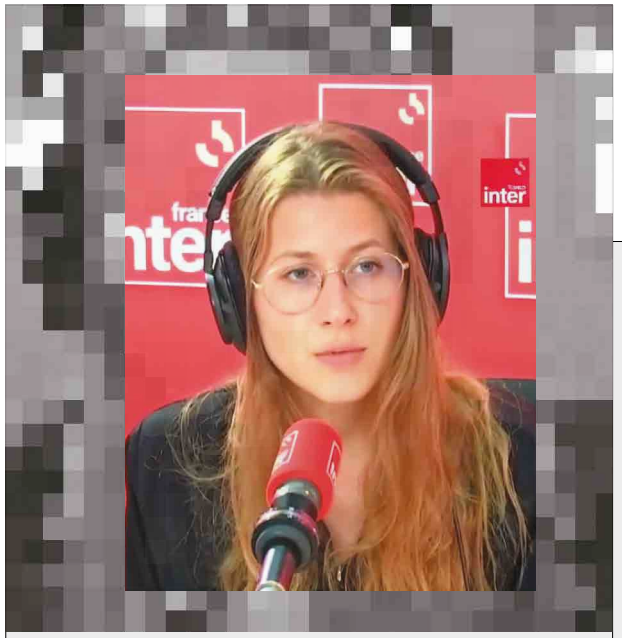
Elon Musk's Grok Chatbot Has Started Reciting Climate Denial Talking Points

The latest version of Grok, the chatbot created by Elon Musk's xAI, is promoting fringe climate viewpoints in a way it hasn't done before, observers say

BY SCOTT WALDMAN & E&E NEWS

(1) ADEME, Social Representations of Climate Change, October 2024
(2) IPSOS, People and Climate Change 2025, April 2025
(3) Columbia University, Global Study Finds Trust of Climate Scientists Split Across Political Spectrum, April 2025
(4) EDMO, Disinformation in January suggests that the EU overturns national elections, February 17, 2025

AI: *misinformation's* secret weapon



Eva Morel

Co-founder,
Quota Climat

If AI experts speak little of climate, and climate specialists rarely engage with AI, how can we maintain a nuanced position and effectively combat misinformation? Moreover, how do we prevent AI from being weaponised to amplify alarmist narratives with each new crisis — whether wildfires in California or unrest in Los Angeles?

The challenge is compounded by today's fluid information landscape, where the boundaries between traditional media and social platforms have eroded. Journalists themselves may unintentionally spread false information — sometimes driven by excessive reliance on AI tools in an effort to keep pace with innovation, inadvertently worsening the sector's environmental footprint.

AI plays an ambivalent role: it accelerates the creation and dissemination of climate disinformation, yet also enables large-scale detection of such content. These tools allow for the identification of patterns that were nearly impossible to trace manually just two years ago, offering new means to counter coordinated disinformation campaigns.

128 cases of climate disinformation were detected in French audiovisual media in only a three-month period — an average of 10 incidents per week.

373 instances of "inaction discourse," aimed at downplaying climate urgency were identified during the same period through automated language processing algorithms.

Source: QuotaClimat, First results of automated detection of climate disinformation in French television and radio, April 2025

MEASURING *THE INVISIBLE:* A MAJOR CHALLENGE

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AI vastly increases *the environmental burden* of digital technology

The rise of artificial intelligence has expanded the environmental footprint of the digital sector. Microsoft announced in May 2024 a 30% jump in its CO_2 emissions last year and Google's jumped 13% in 2023, a +48% increase since 2019.

But the problem is not so much in unit consumption as in the exponential increase in the use of generative AI tools.

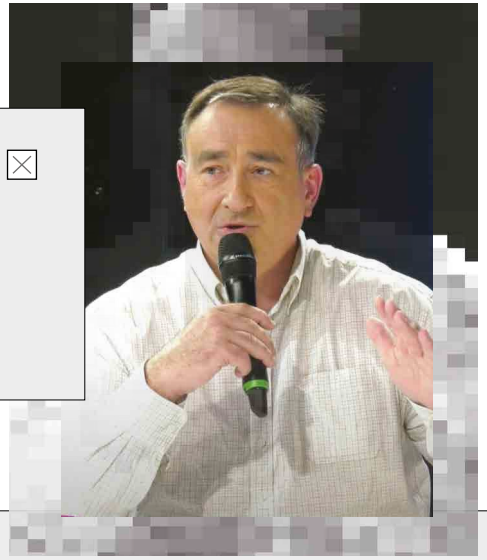
The International Energy Agency (IEA) delete this estimates **that global electricity consumption by data centres could reach between 600 and 800 TWh in 2030 (excluding crypto), more than total electricity production in France in 2024 (536.5 TWh)**.

Sam Altman, OpenAI's boss, attempting to reassure concerns around energy consumption said:
"People are often curious about how much energy a ChatGPT query consumes; on average, a query uses about 0.34 Wh, roughly what an oven would consume in just over a second, or what a high-efficiency bulb would use in a few minutes."

*Energy and AI, IEA.

Hugues Ferrebœuf

Digital Project Director,
The Shift Project



In 2018, we were already asking the questions: Is digital technology good for the environment or is it a problem?

It was clear even then that it was going to be an issue, with digital technology responsible for 3%-4% of global emissions in 2018.

While this may seem insignificant, it's important to put it into perspective - that's half the total emissions of the automotive sector. Moreover, this footprint is growing at a faster rate than any other sectors, increasing at a rate of around 5% to 6% per year; and that's before the impact of Generative AI. The 'unlimited' potential of Generative AI is likely to aggravate the issue more.

A need for *transparency and comprehensive* measurement

Many fundamental aspects of the digital sector's environmental impact remain insufficiently analyzed. This is particularly true for submarine cables, which are still poorly studied—much like the telecommunications satellite sector before its rapid expansion.

A life cycle approach, encompassing everything from resource extraction to the end-of-life of equipment, will be crucial to fully understand these impacts.

The opacity of digital companies regarding their products and supply chains, along with the lack of data on the disposal and recycling of electronic equipment, significantly hinders accurate and comprehensive assessment.

Moreover, most current evaluations fail to account for the rebound effect—wherein increased energy efficiency leads to higher overall usage.

*Ionising radiation, fine particle emissions, fine particle reaction, photochemical ozone creation, acidification, eutrophication (aquatic and terrestrial), ecotoxicity (freshwater aquatic), human health toxicity (non-carcinogenic), human health toxicity (carcinogenic), land use.

Mathieu Wellhoff

Head of Green IT team, ***ADEME***

Most estimates focus primarily on greenhouse gas emissions. However, the environmental footprint of digital technology extends far beyond this, encompassing energy use, the consumption of minerals and metals, water usage, and twelve other indicators defined by the European Commission.

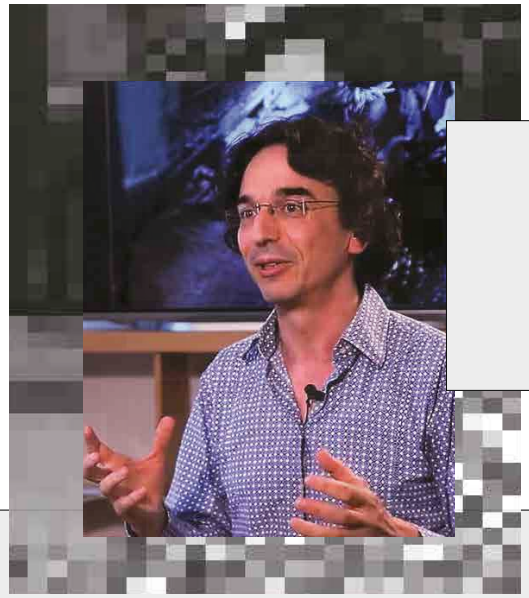
The sector lacks sufficient transparency to provide the structured data necessary for accurately assessing its impact. Moreover, the topic itself is not yet mature enough for robust quantification. For now, we have chosen to forgo precise measurement.

Working together:
the open science imperative

The lack of clarity behind the development and use of generative AI models means transparency and scientific collaboration will be more important than ever. By enabling greater access to research methods, data and results, the Open Science approach favours the emergence of reliable standards for measuring AI's environmental impact.

This collaboration accelerates responsible innovation and opens access to the key knowledge necessary for supporting ecological and sustainable practices in technology.

By sharing their methods and building common reference frameworks, researchers, developers and companies can collectively design more efficient AI while maintaining high performance for the most essential use cases.



David Chavalarias

Research Director,
CNRS

Transparency is needed regarding AI models and their training processes —including a full life cycle assessment covering training, usage, and duration of use.

The more proactively the AI industry addresses these issues, embraces transparency, and demonstrates efforts to operate within planetary boundaries, the more it will be perceived as credible and responsible. We are more likely to extend the benefit of the doubt to actors who make a visible effort from the outset.

Measuring methods:
complexity remains...

Faced with the urgency of quantifying AI's environmental impact, several methodologies are emerging.
But their implementation reveals major methodological challenges that currently limit reliable evaluation.

Interesting methods:

Life Cycle Assessment (LCA):

standardised methodology (ISO 14040) that evaluates the impact of a product/service over its entire life cycle (raw material extraction, manufacturing, use, end-of-life).

Direct energy impact:

measurement of energy consumption during training and inference phases (kWh, PUE).

AI Energy Score Leaderboard

GHG emissions (scope 1, 2, 3):

calculation of direct and indirect emissions. Disparity in calculation methodologies for indirect emissions (scope 3) often renders reporting incomplete.

genai-impact/
ecologits

EcoLogits tracks the energy consumption and environmental footprint of using generative AI

184 Stars 20 Forks

EcoLogits

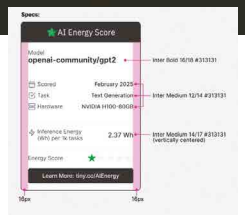
demo-ecologits.py

```
from ecologits import EcoLogits
from openai import OpenAI

# Initialize EcoLogits
EcoLogits.init()

client = OpenAI(api_key="<OPENAI_API_KEY>")

response = client.chat.completions.create(
    model="gpt-3.5-turbo",
    messages=[
        {"role": "user", "content": "Tell me a joke!"}
    ]
)
```



Multi-impact indicators:

evaluation includes water and rare metals necessary for AI models, but the absence of metrics standardisation makes measurement very delicate for AI.

Identified limitations:

Opacity of proprietary models:
limited access to training data and architecture

Impact allocation:
how to attribute impact between different users of shared infrastructure

Rebound effect and uses:
energy efficiency gains are often cancelled by increased usage

Comparability:
absence of common reference framework to compare different models/approaches

... but promising *tools and ecosystem.*

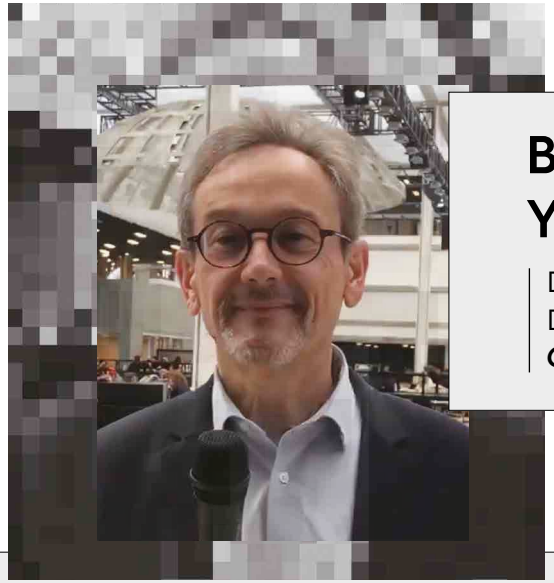
AI Energy Score by Hugging Face: is a standardized benchmark designed to compare the energy efficiency of open-source models, independently of the infrastructure used.

Code Carbon: is an open-source Python library widely adopted in the AI community; it enables developers to track energy consumption and CO_2 emissions from their code in real time.

Ecologits (GenAI impact): is a dual-purpose tool that offers a public calculator for simulating the environmental impact of AI usage scenarios, as well as a Python library that integrates with major AI providers—such as OpenAI, Mistral, and Anthropic—for monitoring in production environments.

BoAmps: developed by the Boavizta collective, is a collaborative database focused on the environmental footprints of large AI models. It supports measurement approaches aligned with life cycle assessment standards.

Finally, the Digital Product Passport, supported by the European Commission, is a traceability initiative aimed at capturing the full life cycle of digital products through a unified information architecture.



Bernard Yannou

Deputy Research Director,
CentraleSupélec

When applied to AI systems, the Digital Product Passport would enable environmental labelling based on real-time product data, addressing the limitations of traditional ecodesign approaches, which often rely on hypothetical scenarios rather than actual usage.

NO MAGIC WAND:

TOOLS, STANDARDS AND INNOVATIVE PROJECTS

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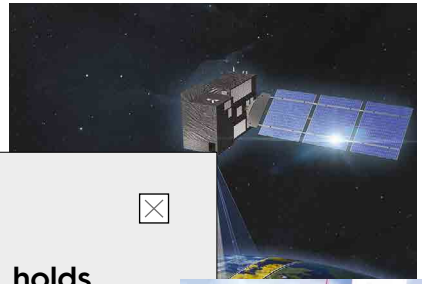
AI for Green: *[work in progress...]*



While AI contributes significantly to the environmental footprint of digital technology, it also holds potential to support the ecological transition and reduce that very footprint. This is the premise championed by proponents of "AI for Green."

From environmental monitoring and simulation to resource and infrastructure optimisation, AI can serve as a powerful tool for improving the management and use of resources within the context of ecological transition. However, these potential benefits remain under assessment, and their implementation faces substantial energy-related challenges.

SÉNAT

"Within the framework of ecological transition, AI is identified as a lever to optimise exploitation or management of resources, equipment and infrastructure. Many companies are behind innovative applications and services aimed at improving supply chains and decision support or risk management"

Senate information report, 20 February 2025

Mila

Mila's AI for Climate Studio - Quebec AI Institute - mobilises research and technologies. It acts as a catalyst between researchers, NGOs and public decision-makers. Among its projects: deforestation monitoring and building energy optimisation.

Mila's AI for Climate Studio: Leveraging AI for a Sustainable Future

nature

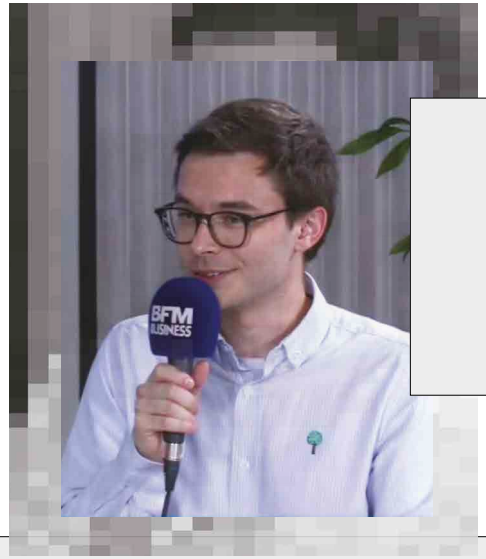
"In recent years, artificial intelligence (AI) has profoundly transformed many domains, including Earth system sciences, by improving weather forecasting, model emulation, parameter estimation and extreme event prediction."

Artificial intelligence for modeling and understanding extreme weather and climate events (Nature, 24 February 2025)

Green AI:
[change in progress...]

The Green AI movement advocates for the development and use of AI in ways that minimize its ecological footprint. This includes strategies such as ecodesign, process optimization, and waste reduction.

The guiding principle is to prioritize applications that can run tomorrow on older computers. To support this shift, carbon footprint calculation tools and software modules are being introduced to raise awareness among developers.



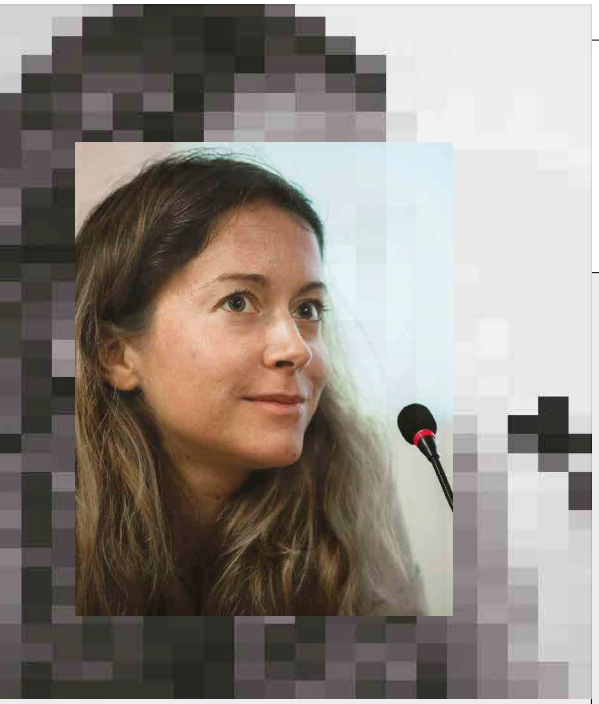
Samuel Rincé

President & Co-founder of ***GenAI Impact***

Our approach is grounded in an objective analysis of technologies, evaluating both their positive and negative impacts without ideological bias. In the face of claims positioning AI as a universal solution to environmental challenges, it is essential to maintain a critical and balanced perspective.

This involves adapting the tool to the task, evaluating the real complexity level of the need before choosing an AI model. By default, we favour sobriety: start with the lightest possible model and only increase power if necessary.

When relevant, we substitute generalist LLMs with specialised low-footprint tools, particularly for simple tasks like text correction. Finally, we measure the differential impact of uses, keeping in mind that an advanced reasoning model can consume up to ten times more energy than a simple query.



Juliette Fropier

AI Project Manager,
Ministère de l'écologie

"Questioning *all-AI*": towards frugal AI?

Understanding the distinction between generative AI and traditional AI is essential to fully understand the what we are trying to achieve. The most concerning environmental impacts stem from generative AI, which relies on ultra-high-performance processors with signficant demands on water, energy, and data center infrastructure. In contrast, traditional AI enables truly impactful use cases. We are currently testing 12 demonstrators across various regions to support initiatvies such as energy-efficient building renovations, leak detection in water networks, and drought prevention and prediction. These rely on machine learning, optimisation and forecasting - not generative AI.

More broadly, we must adopt a more measure and reasoned approach to AI usage. This begins by challenging the default assumption that every project needs to involve AI to be completed. We advocate for a needs-based approach: start by identifying the problem, then determine whether AI is an applicable solution.

Today, many companies invest in AI out of fear of missing out on the innovation gold rush, while others reject it due to its environmental footprint. In response, we must maintain a balanced and nuanced perspective: Ai is not a panacea, and it will not save the planet - but certain AI tools are undeniably powerful and effective.

France's national AI strategy now positions frugal AI as a key differentiator. This is a valuable way to assert out uniqueness and strengthen our competitiveness. Environmental criteria are already integrated into our project calls - an approach that could and should be extended further.

A pragmatic approach: *reconciling performance and frugality*

Joëlle Pineau

Researcher and Associate Professor at ***McGill University School of Computer Science***

When we invented the refrigerator, we were focused on how to develop this technology, not on energy optimisation. Once the technology is widely distributed, efficiency improves.

Having lighter, faster models that run with fewer calculations presents economic and ecological advantages. The open source approach also allows the community to quickly create optimised versions of LLMs.

Concerning indicators for measuring the environmental impact of generative AI, the best indicators are those on which we can agree so that all actors use them. It's not realistic realistic to think we'll only take the frugality path. We must reconcile both approaches: **continue working on very powerful large models and develop more efficient, more frugal behaviours..**

Performance through
common standards and collective effort

Towards a global standard? Methodological convergence and data transparency are emerging as as essential conditions from current fog and establish reliable comparisons.

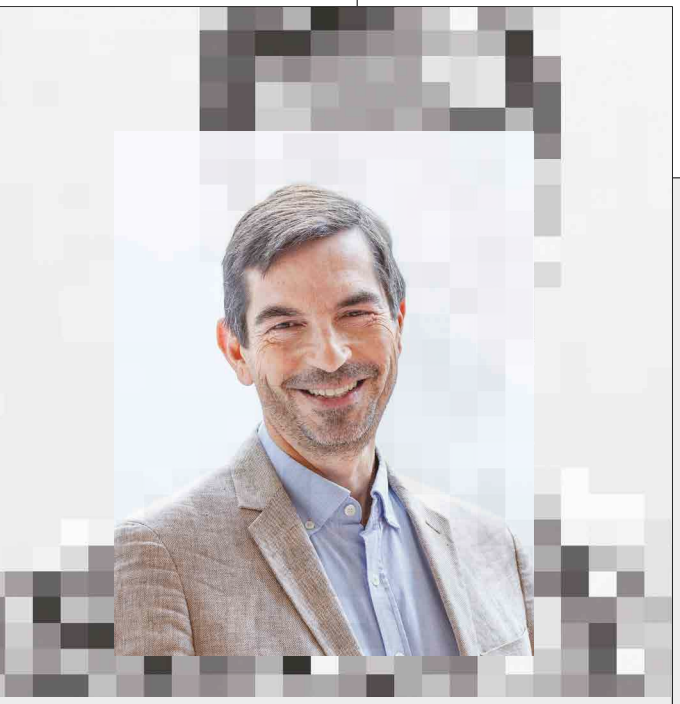
REEN Law:
first global framework imposing collection of environmental data from data centres, it allows ARCEP to collect and publish aggregated information on digital impact, creating a unique regulatory precedent.

Coalition for Sustainable AI:
international initiative launched during the AI Action Summit in Paris. Aims to coordinate international efforts to develop common impact measurement standards and promote best practices globally.

European AI Act:
introduces transparency requirements on resource consumption of high-risk AI models. Imposes documentation specifying carbon and environmental footprint of training and deployment phases.

The International Energy Agency has established an observatory on energy and AI aimed at encouraging transmission of quantified data by companies. France supports this initiative within the Canadian G7 on energy.

Refocusing efforts *on impact ROI*



Yves Nicolas

AI Programme Director and Deputy Technology Director, ***Sopra Steria***

The goal is not to block innovation or frame AI and ecological transition as opposing forces. Rather, we must ensure AI development is not used as an excuse to delay essential decarbonisation efforts.

It is urgent to refocus on high-impact, high-ROI use cases—projects where the environmental cost of developing, training, and running AI is justified by real benefits. Too often, we use massive resources for minor tasks—like using a hammer to crush a fly.

Frugal, measured, and transparent AI is not a fantasy. Europe is already working on standards to reduce environmental impact across the AI life cycle, and we must support these efforts.

At Sopra Steria, we actively raise awareness within our teams and build collaborative tools to measure, understand, and reduce AI's footprint. This is central to our strategy, reflected in concrete commitments such as **the Positive AI initiative**, **Confiance.ai**, **the European AI Foundation**, **and our contributions to AFNOR's work on frugal AI.**

We believe financial logic must be complemented by systematic impact indicators. As tech companies, it is our responsibility to guide AI toward more sustainable and responsible practices.

More support for innovative projects

Faced with environmental challenges of digital technology and AI, many actors are developing concrete solutions to reconcile technological performance and controlled ecological impact. Sopra Steria is fully engaged in this dynamic, by designing its own solutions (G4IT, EcoMind AI), by supporting impact innovation with its July 2024 investment in the Wind fund and by concretising new partnerships with greentech startups.

HTTPS://WITHEXXA.COM

[EXXA – #AI#SUSTAINABLEIT]

/Ultra-efficient LLM with low environmental impact

Exxa is a sustainable AI inference platform, optimised for low-cost batch processing on open source models like Llama 3 70B. By relying on off-peak computing capabilities and low-emission GPUs, Exxa guarantees performance and minimal environmental impact thanks to a custom scheduler and predictive optimiser.

HTTPS://WWW.SOPRASTERIA.COM

[G4IT & ECOMIND AI]

/Reasoning, with reason

Developed by Sopra Steria, G4IT and ECOMIND AI are two complementary solutions serving digital ecological transition.

G4IT allows Information Systems Departments to automatically measure their information system's environmental impact. Built with the Ministry of Ecological Transition, its calculation engine relies on public reference frameworks to guide responsible digital strategies.

In parallel, ECOMIND AI addresses AI developers concerned with sobriety: this tool evaluates upstream the environmental footprint of predictive or generative AI models, before their production deployment. It thus enables anticipating energy impacts and designing more sustainable AI from the development phase.

HTTPS://SOPHT.COM/

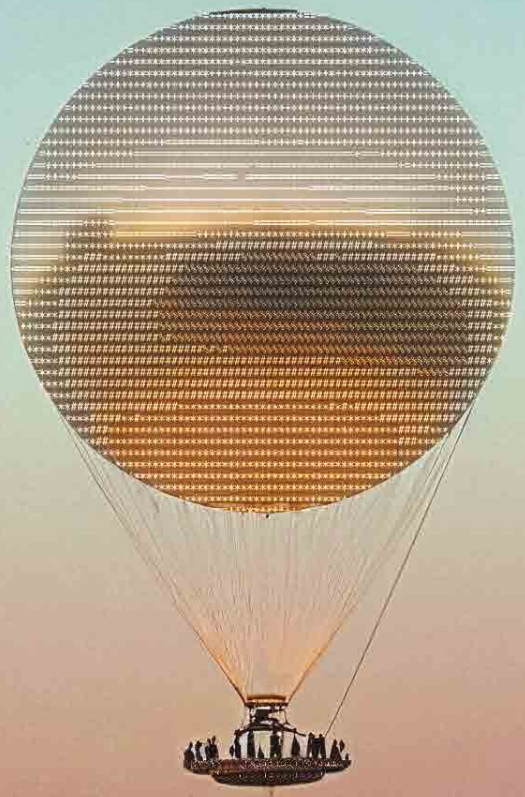
[SOPHT – #GREENTECH#GREENIT]

/Green ITOps to decarbonise your IT

Sopht helps companies decarbonise their infrastructure through a Green IT solution that automates data collection, simulates environmental impact and tracks emissions in real time. It identifies over 80 levers to pilot sustainability and optimise carbon and financial ROI.

Faced with the rise of generative and agentic AI, Sopht enables its clients to reduce the CO2 and euro cost of this IT transformation, but above all to recommend and simulate the most frugal alternatives.

IMPACT AI: FRANCE LEADING THE WAY



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Cyril Malargé

| CEO, ***Sopra Steria***

United around finding a third way

CONCLUSION

Faced with the challenge of aligning artificial intelligence development with ecological transition, Sopra Steria is committed to responsible and measured innovation. Our study highlights a troubling paradox: while AI's environmental impact is growing, public discussion remains limited and polarized, creating an "information fog" that hinders collective action.

France is well positioned to lead in this field, thanks to its ability to combine ambitious regulation with pragmatic innovation. From the REEN law to the AFNOR standard on frugal AI, and initiatives like the Coalition for Sustainable AI, the country is setting standards that have the potential to influence far beyond its borders.

As a key player in digital transformation, our role is to support the entire ecosystem in this transition. This means moving beyond unproductive debates between blind techno-optimism and total rejection of AI, and instead building a third path—one of reasoned, efficient, and measurable AI.

The fight against climate change will not be won by opposing technology, but by using it wisely. It is our responsibility to help bring together all actors in the sector to develop tools and solutions that make AI and sustainability work together.

APPENDICES
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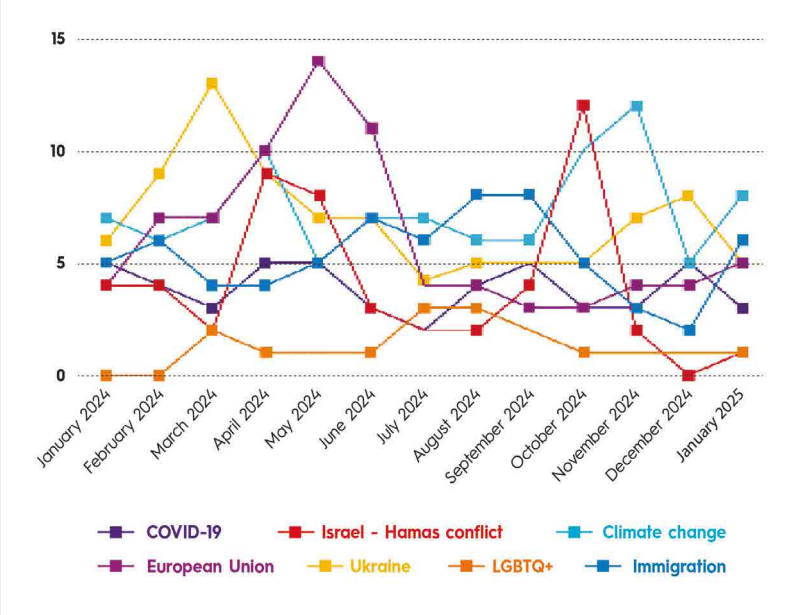
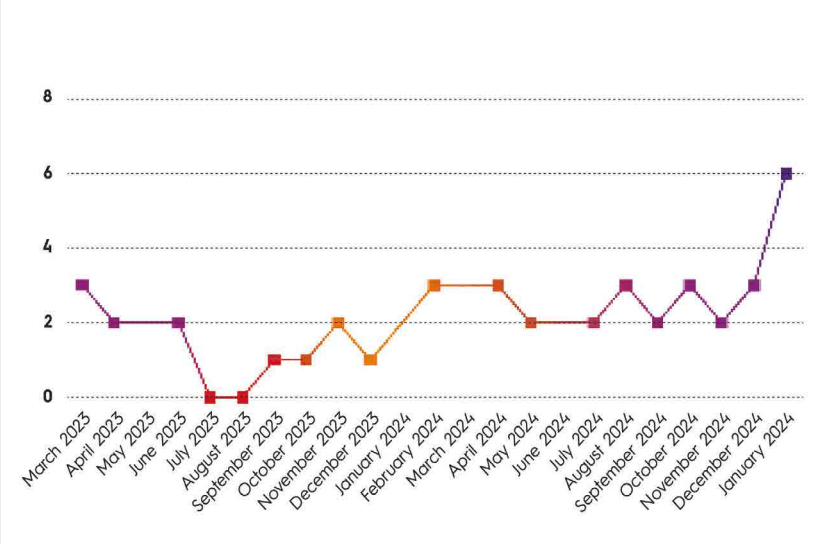
Climate disinformation *generated by AI, is on the rise* since November 2024.

EDMO (European Digital Media Observatory) alerts: in January 2025 climate change was the target of most of the disinformation caused by generative AI. The climate-sceptic narrative has been gaining traction in scope and virality, establishing itself a central issue of political and emotional manipulation.

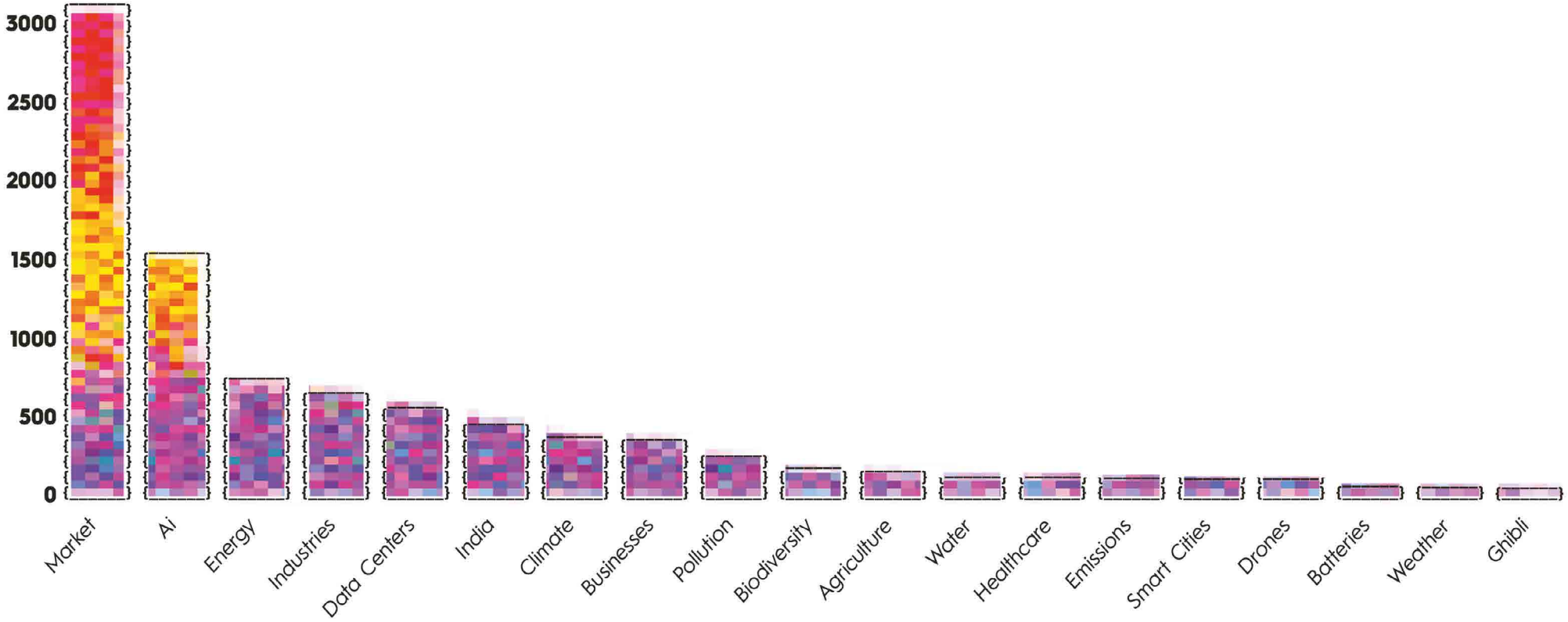


In its January 2025 report, EDMO signalled a marked increase in AI-generated disinformation. Its share increases from November 2024 to reach 8% in January, following a curve similar to that of climate disinformation. AI becomes a central lever in producing manipulative, political and identity narratives.



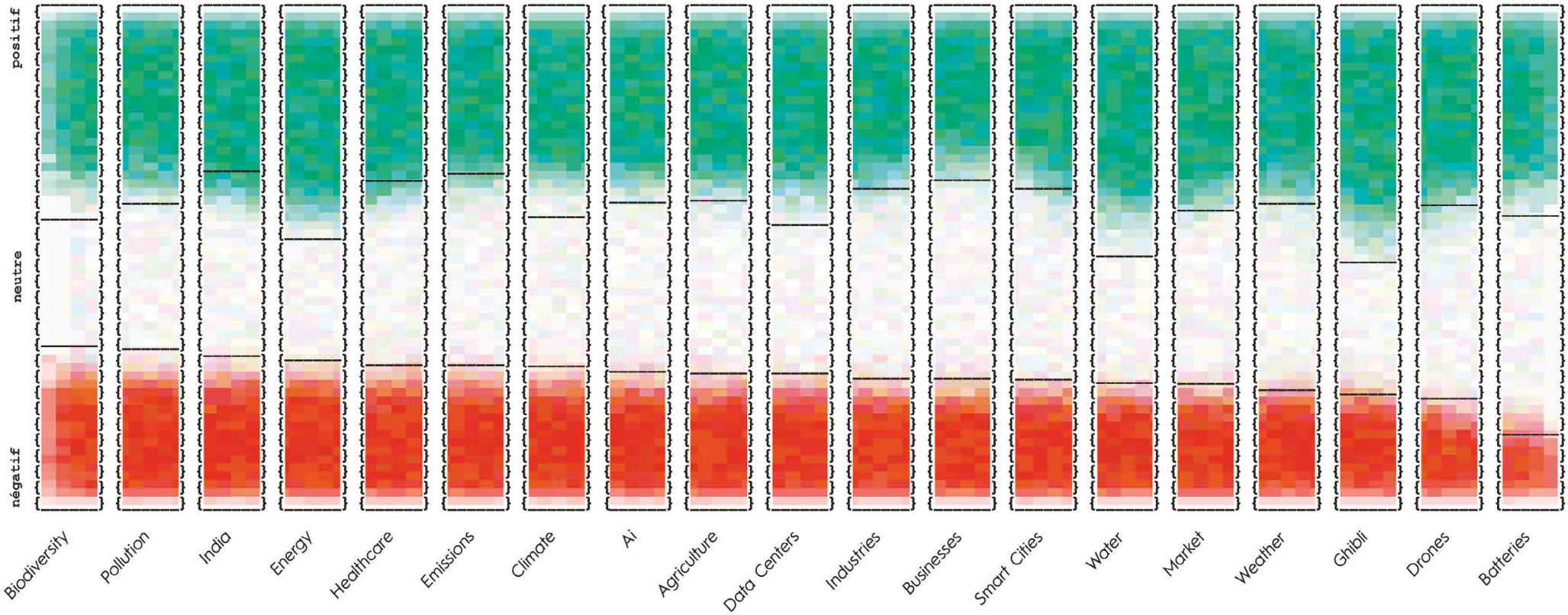
In January 2025, the EDMO network published their Monthly Brief n°44. Of 1,642 fact-checking articles, 150 concerned climate, i.e. 9%. Climate change established itself as the main subject of disinformation that month. A trend that underlines the central role of climate narratives in emotional and political manipulation strategies.

Narrative angles in *AI coverage in media* in 2024-2025



21,970 articles from 2024 and 2025 collected from 171 media sites, categorized by AI into 19 main themes.

Narrative tone in *AI coverage* in media



21,970 articles from 2024 and 2025 collected from 171 media sites, categorized by AI into 19 main themes.

Photos and *illustrations*:

Couver : -Generated photos of Midjourney

Page 13: - Starter pack featuring astronaut Thomas Pesquet. (X screenshot)
- Thomas Pesquet LinkedIn post. (LinkedIn screenshot)

Page 15: - Artist's impression of the lunar Artemis base
Source: NASA (https://www.senat.fr/rap/r22-668/r22-6681.html)
- Illustration: AI for Climate Action Award 2025
- People working in AI protesting in Parliament Square in 2023.
Photographer: Vuk Valcic/Zuma Press Wire/Shutterstock
- Illustration from antitechresistance website (https://www.antitechresistance.org)
- Anti-tech mobilisation in Paris against the AI summit
(https://www.antitechresistance.org/blog/mobilisation-anti-tech-paris-sommet-ia)
- AI, Energy and Climate Podcast
(https://podcasts.apple.com/au/podcast/ai-energy-and-climate-podcast/id1798264288)
- Video occupation change now Paris 2025 Anti-tech resistance
(Facebook : www.facebook.com/reel/694551106297225/)
-The Line project: Neom

Page 16: - Facebook post: (https://www.facebook.com/photo.php?fbid=1225452672924353
id=100063788953856&set=a.437493068386988)

Page 17: - LinkedIn post Timothy Papandreou: (https://www.linkedin.com/posts/timothypapandreou genera-
tiveai-transformation-digital-activity-7175463050341163010-wtFT/)

Page 18: - Ashley Landis/AP: (https://www.businessinsider.com/ai-generated-art-cant-by-copyrighted-feder-
al-judge-rules-2023-8)

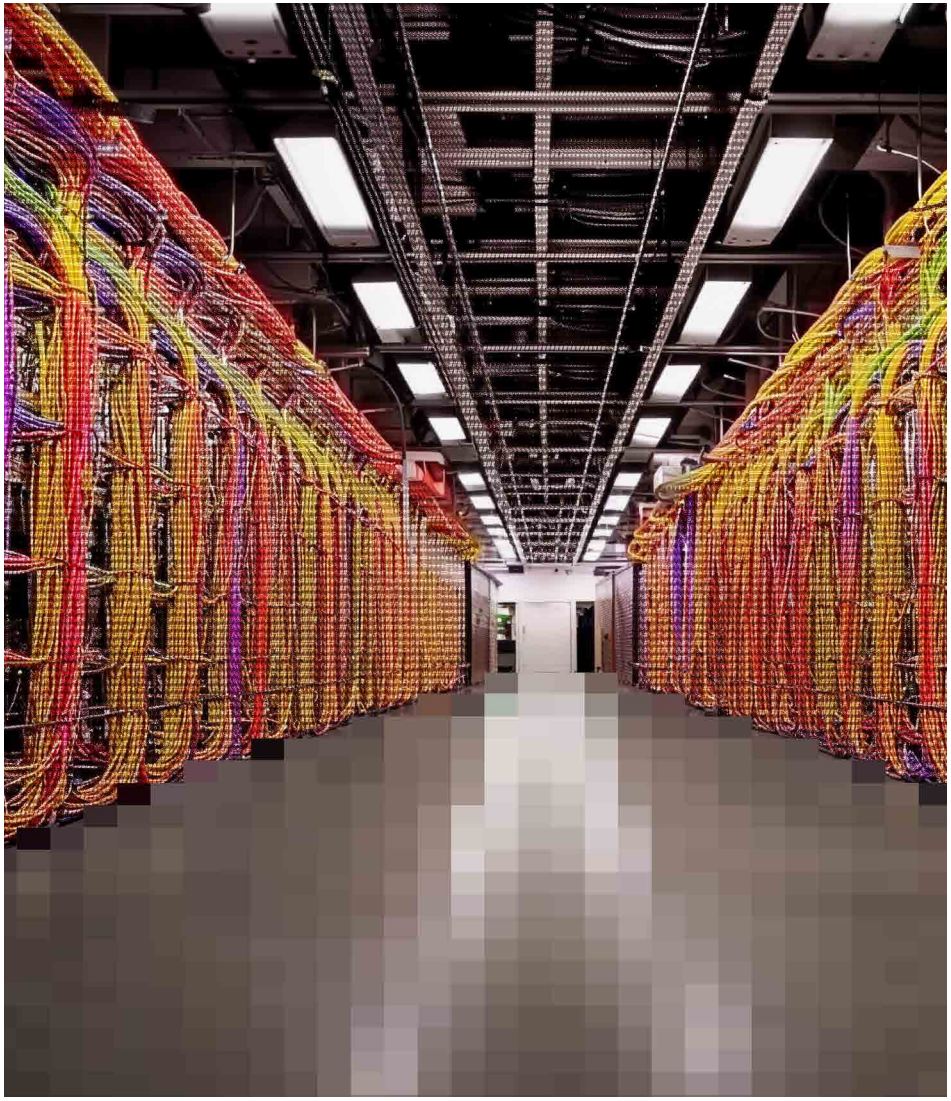
Page 19: - Cover book Pilar Sipes:
(https://www.amazon.co.uk/Combating-Climate-Change-AI-Solutions/dp/B0D4F8JBMT)

Page 22: - Gen AI impact: (https://github.com/genai-impact/ecologits)
- Eco Logits: (https://genai-impact.org/fr/)
- AI Energy Score Leaderboard logo: (https://github.com/huggingface/AIEnergyScore/blob/main/index.md)

Page 25: - Satellite: Artistic view of the Copernicus CO2M programme (© OHB)
- Wind turbine: Aerones illustration photo (https://aerones.com/fr/accueil/)
- AI Energy Score Leaderboard logo: (https://github.com/huggingface/AIEnergyScore/blob/main/index.md)

Page 29 : - The European Parliament, in Brussels, 22 June 2022. JOHN THYS / AFP
- Group photo of participants at the AI Action Summit in Paris

Getty : GettyImages-2200545655, GettyImages-2210029474, GettyImages-2210029558,
GettyImages-2162474987, GettyImages-2210029530, GettyImages-1661292934



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The world is how we shape it.*

PRESS CONTACTS

AURÉLIEN FLAUGNATTI
+33 6 30 84 75 81
aurelien.flaugnatti@soprasteria.com

LAURA BANDIERA
+33 6 85 74 05 01
laura.bandiera@soprasteria.com

EDITORIAL TEAM

MATHILDE RICHARD,
LAURA BANDIERA,
MAXIME ROCHER,
OPSCI.AI

ART DIRECTION

MAXIME ROCHER
MATTHIEU NOURISSON
BLANDINE RIGHI

AI & ENVIRONMENT: CLEARING *THE INFORMATION FOG*

REPORT - JUNE 2025

*Le monde est tel que nous le façonnons.