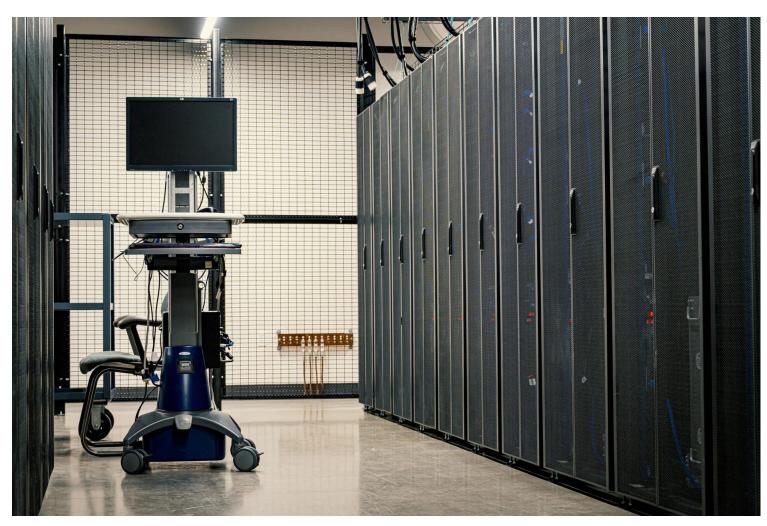☆ **PREMIUM**

It's time to talk about AI

Is the sunk cost worth the impact?

January 30, 2025 Michaela Keil

Data server room. Photo: Pexels

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When people began using the internet, businesses and individuals started to use the web as a way to connect. When Instagram became popular, businesses jumped on that too. When Charli xcx released the album "Brat," everyone — businesses and politicians included — wanted in.

The hot new thing of the last few years is AI.

But unlike making a website or posting an homage to the "Brat" album art, AI is expensive. Not just in cost to build and maintain, but expensive in resources. The data centers that house and train AIs require massive amounts of electricity to run, produce tons (literally) of electronic waste, require immense amounts of water to keep the computers cool and rely on rare minerals that often are mined unsustainably.

Although some new companies are showing that AI has the potential to be less wasteful than it currently is, the industry is on track to become a new major producer of greenhouse gas emissions. Millions of people, whether they know it or not, use some form of AI in their daily lives. However, the casual uses and capitalization of these new technologies may be more wasteful than if they were applied to specific problems and industries. When it comes to the climate crisis, all that energy put into AI may actually be able to help if put toward sustainable uses.

Microsoft, which is invested in OpenAI, announced a 29% increase in CO2 emissions since 2020. Google's greenhouse gas emissions increased 48% between 2019 and 2023, primarily due to increases in data center energy consumption.

Energy and technology companies are in a race to create more energy to match the demand. Some predictions posit that the electricity demand for data centers (which includes AI and crypto mining operations) will double from 2022 to 2026. By the end of the decade, data centers could consume 25% of U.S. electricity.

Mining rig. Photo: Pexels

It's hard to picture how large an AI system is. Consider machine learning on a small scale. (Machine learning is the basis of what most AI is, though machine learning and generative AI have different uses.) In a closed-loop system, like a video game, it takes hundreds of hours to train an AI to be optimized for success.

YouTuber Yosh spent three years developing an AI to beat him in a racing video game. Yosh used a neural network to train the AI which included only a few parameters like speed, direction, braking, velocity and where the car is in relation to the track. Each parameter needed to be tested in various ways and in relation to each of the others, and the AI learned from the outcome of each test. Yosh's neural network was microscopic compared to the size of the neural networks used in generative AI. OpenAI's ChatGPT-4, a type of generative AI called a large language model, has over 1.7 trillion parameters. To train and run ChatGPT-4 takes about 100,000 high-powered computers and thousands of hours.

And still, the computational power needed to sustain AI's growth doubles roughly every 100 days.

With this much demand, it makes sense then that Microsoft, Google, Amazon and Meta are exploring in-house energy production — and they're betting billions on it. Nuclear reactors, 30-year gas plants and some renewable energies are on the table. Gas power plants, which are the easiest to scale, also produce the most emissions and contribute most to climate change. Many renewable energy systems, like solar and wind, aren't ready to sufficiently power mega data centers, though the technology is quickly improving. If fossil fuels are used to rapidly scale AI, many climate goals will be put even further out of reach.

Some AI companies, like DeepSeek, which is considered a rival of ChatGPT, are more energy- and resource-efficient. DeepSeek undercut all the energy consumption predictions of other AI companies. Further, the Chinese-owned company did it without the expensive chips and semiconductors used in the US due to a US sanction. The energy sector of the stock market briefly plummeted on Monday, Jan. 27, when DeepSeek burst onto the scene, though the plans for companies to expand energy production to meet data center needs were not affected.

If DeepSeek can do it, then other AI companies should be able to do it, too, right? Probably, but that's only part of the solution. Alex de Vries, a data scientist at the central bank of the Netherlands, explained to Scientific American, "Every time a major new technology makes a process more efficient, it actually leads to more people demanding whatever is being produced. Efficiency boosts demand, so boosting efficiency is not really saving energy in the end." The casual demand is far more impactful, as de Vries further elaborated, "If you were to fully turn Google's search engine into something like ChatGPT, and everyone used it that way — so you would have nine billion chatbot interactions instead of nine billion regular searches per day — then the energy use of Google would spike. Google would need as much power as Ireland just to run its search engine."

Increasingly, the public wants AI. It is heavily used in the US and abroad, especially generative AI — the story-generating, communications-writing, meme-making type of AI. For financial predictions, agricultural analysis, transit system organization, and other closed industry uses, AI is incredibly powerful in optimizing and finding logical paths. The drawbacks of using generative AI for school, law, journalism and research are well documented due to chatbots' tendency to hallucinate. Casual use of AI may be the larger problem. Eventually, like all industries, the use of AI will be

at least somewhat regulated — but not before companies have figured out how to make back their investments. Until then, the energy use puts the climate crisis into stark relief.

AI can and should be used in solving the climate crisis. But moderation is key. More gas powerplants are not the answer, and ironically, ChatGPT knows this. When prompted "How can AI play a role in solving the climate crisis?" The chatbot explained: "While AI can help solve the climate crisis, the computational resources required for AI models (especially large models) can consume a significant amount of energy. It's essential to ensure that AI is used in ways that complement efforts to reduce carbon emissions, such as using renewable energy for AI infrastructure."

The chatbot also took a surprisingly humanistic approach, explaining "AI should be involved in parts of solving the climate crisis where its strengths — data processing, optimization, prediction, and automation — can make a substantial impact. However, human input remains crucial for ethical considerations, leadership, innovation, and addressing the human side of the crisis, like equity and justice. The combination of both is what will likely lead to the most successful and sustainable outcomes."

The combination of both is what will likely lead to the most successful and sustainable outcomes. For example, AI can optimize energy systems to ensure low waste, it can better sort recycling to ensure more materials are recycled and it can optimize supply chains and food systems to predict demand better and reduce waste. The issue is that it may be harder to stop using generative AI to create Jesus minion memes and fake cookbooks than it is to actually implement the AI in the climate crisis.

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