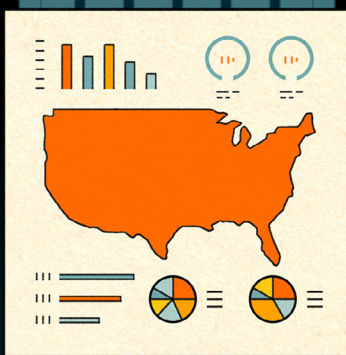


Turning the Tide

Climate Action In and Against Tech

by Tamara Kneese

**DATA &
SOCIETY**



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Executive Summary

We are at a critical moment to assess the tech industry's contributions to climate change and environmental destruction. Tech companies are currently capitalizing on the public's fascination with and government support of generative AI to rapidly accelerate the construction of new data centers. Rapid data center construction also means accelerating climate change and other environmental impacts; from the resource extraction and pollution associated with mining and manufacturing to increased water consumption and the sky-rocketing demands on power grids. Allowing this expansion to go unchecked will only make the future harder for us all.

There are thousands of people in the tech industry who understand this problem: **climate-conscious tech workers**, who are concerned about the realities of climate change and who see the tech industry's growing role in it. And many of these workers are extremely active — they start working groups, call for corporate change, develop better tools, and organize for collective action. But there is a problem. The tech industry has a long history of *managing* ecological concerns from employees, regulators, and the public. During decades of environmental advocacy, those in power at tech companies have embraced **forms of environmental labor that prioritize measurement, efficiency, and innovation — a lab mindset**. Ultimately, such approaches, from corporate social responsibility to green software, divert the energy of climate-conscious tech workers away from more holistic approaches to climate action. Dissatisfaction with these metrics-focused approaches to sustainability can lead climate-conscious tech workers to join employee-led working groups or find other ways to voluntarily contribute their time to sustainability initiatives, but such efforts often fail to effect meaningful change and can also lead to burnout.

Emerging from the murkiness of employee volunteerism is another option. Many activists, such as tech workers, ex-tech workers, and tech-adjacent experts, instead adopt an **organizer mindset**. For them, the question remains how to collect *viable counterdata* on the industry's environmental impacts while ensuring that such data leads to meaningful change. This report examines the ways that tech workers and larger coalitions have attempted to reform the tech industry from within while applying external forms of pressure through policymaking and activism. *How do climate-conscious tech workers organize inside and outside their workplaces in a time of AI ascendance and data center accelerationism?* **By engaging in workplace activism and forming broader coalitions with environmental justice organizations, climate-conscious tech workers who adhere to the organizer mindset use their insider knowledge to advocate for social change rather than technical tweaks.**

Based on 12 months of research alongside climate-conscious tech workers (both inside and outside of companies) **this report documents how tech-focused climate work gets done today and its political stakes.** For those working inside companies, it's clear that data (its collection, measurement, and calculation) can be used by corporate actors to blunt activism and obfuscate their true impacts. While located outside of companies, activists leverage their own ad hoc data collection methods to excavate the black boxes created by tech corporations while attempting to make their counterdata viable enough to translate into policy recommendations and legal strategies. Communities have their own embodied experiences of living next to data centers and related energy infrastructures, and these forms of data are just as essential as quantitative assessments of water, energy, and carbon costs. Measurement practices will only translate into real change if there is also regulatory and public pressure, which require both policy interventions and activist movements to ensure that corporate promises are kept.

By situating current corporate and government investments in AI and energy infrastructures through qualitative interviews, participatory research, and historical analysis, this report traces the trajectories of tech workers who are attempting to change organizations from within and who are turning to grassroots strategies as the contradiction between corporate growth and environmental sustainability is heightened in this period of intensification. **I argue that corporate measurement regimes can become a trap, acting as a barrier to action through their obfuscation of tangible harms, but that the general lack of transparency around AI's environmental impacts has also created an atmosphere of information asymmetry: community organizers are working on their own forms of data collection to make their critiques visible to policymakers and legal systems.** While tech companies use numbers to hide their environmental impacts, there is still a dire need for producing more holistic evaluation frameworks that consider quantitative energy and water use metrics alongside the embodied repercussions of living near data centers and energy infrastructures. But tech companies cannot be trusted to provide accurate data and to take meaningful action.

This report ends with a series of recommendations for how to help close the gap between corporate sustainability metrics and on-the-ground community resistance:

- **Combine internal pressure with coalition building**
- **Gather qualitative data alongside quantitative data**
- **Lend expertise and labor to existing grassroots movements**
- **Seed regional and transnational comparisons**
- **Document and address the larger supply chain**
- **Acknowledge histories of environmental racism and economic inequality**

Introduction

Holly and Will Alpine worked at Microsoft for years, pushing the company to address its role in climate change. In 2018, Holly cofounded Microsoft’s popular climate network for employees, the Sustainability Connected Community, which eventually had more than 10,000 members worldwide.¹ She also founded and led Microsoft’s global Community Environmental Sustainability program, directing philanthropic investments in sustainability projects for communities near the company’s data centers. During the same period, Will became a leading expert in “green AI” — making artificial intelligence systems more energy efficient — and “green software” — designing software to reduce its climate impact. As a product manager on Microsoft’s AI Platform team, he led the development of responsible AI features in Azure that allowed customers to track the energy and computational costs of their machine-learning workloads. He coauthored one of the most influential academic works on green AI,² cofounded internal initiatives such as the open source Carbon Aware SDK through the Green Software Foundation, and led a category-winning team in Microsoft’s 2023 global hackathon.³ Together, Holly and Will organized hundreds of employees to hold discussion forums, give presentations, and write memos on Microsoft’s fossil fuel expansion, resulting in Microsoft’s first set of Energy Principles. By any measure, Will and Holly were leading voices at the intersection of climate and technology.

Holly and Will exemplify *climate-conscious tech workers*: people with technical backgrounds who are concerned about the realities of climate change, particularly the tech industry’s role in the climate crisis. For Holly, Will, and others like them, this can be difficult to navigate. Large tech companies create massive environmental impacts, from mining rare earth materials to running water and electricity through cavernous data centers. And yet, both Holly and Will found ways to use their jobs to stem the material excesses of the company they worked for. Tech contributed to the problem of climate change, but they saw it as part of the solution.⁴

Only a few years after these high-profile successes at Microsoft, Holly and Will don’t work there anymore. When I ask them why, they describe how they became disillusioned with Microsoft’s

1 Cofounders Drew Wilkinson and Holly Alpine no longer work at Microsoft. Drew has since become a mentor for tech workers who want to incorporate climate into their jobs. Microsoft still features them both on the company’s website, with a photo of them riding their bikes in the streets of Seattle, touting the climate-oriented employee network they created. “We don’t give up easily. ‘No’ doesn’t intimidate us,” Microsoft, accessed August 20, 2025, <https://news.microsoft.com/life/worldwide-sustainability-community/>.

4 I observed the contradictions of “green tech” firsthand as a researcher and strategist at Intel, where I was the director of developer engagement on a green software product team. Part of my remit was looking at how climate conscious tech workers organized across the industry, using their technical skills to reduce the environmental impacts of the tech industry. My research for this report builds on networks I formed from 2021-2023 as part of my work at Intel and Green Software Foundation, where I was part of a policy-focused working group along with members of other tech companies and nonprofits.

climate commitments. Even as they were gaining traction with internal reforms, they saw that the company's expressed priorities continued to be AI, Internet of Things, and cloud computing products — products that can significantly intensify and accelerate oil and gas exploration and production.⁵ As Will put it, “We were doing such great work on a localized scale (e.g., our team/org), but unintentionally enabling a global systemic harm.” How could Microsoft claim to care about climate change when its products, and the emissions tied to its vast AI data centers, were undermining the company's own purported climate goals?

Holly and Will realized that company-sanctioned reform efforts can be limited, both in their scope and impact. Conducting an internal assessment of an AI model's carbon, energy, or water cost across its life cycle, or creating frameworks that consider the various environmental and human rights impacts of tech supply chains, is still distanced from the embodied repercussions that such technologies have on communities and ecosystems.⁶ At the same time that extreme weather events such as floods, fires, and droughts are directly affecting billions of people, resource-intensive technologies like AI and cryptocurrency demand more electricity, use precious water, and contribute to greenhouse gas emissions. Renewable energy cannot immediately compensate for this increase in demand, slowing the transition away from fossil fuels.⁷ Instead, tech companies are lobbying governments to reduce environmental protections and expedite the construction of data centers and energy infrastructures that pollute the land, air, and water. Tech companies do not take responsibility for these systemic impacts and contribute to perpetuating the fossil fuel industry even as they track and disclose specific metrics in their annual sustainability reports. At some point, as we saw in Will and Holly's story, the contradiction between these two ways of viewing the problem of sustainability can become impossible to hold.

Today, Holly and Will advocate for the environment outside of Microsoft. They resigned from their jobs on ethical grounds and pivoted to policy advocacy work, co-founding the Enabled Emissions Campaign to combat advanced technologies that expand fossil fuel production and drive new emissions that are not accounted for in corporate sustainability reports. By mobilizing coalitions, engaging stakeholders, and producing strategic research, the campaign pushes for regulatory reform to hold companies accountable.⁸

Holly and Will's move from inside to outside the tech industry captures a common experience for an increasing number of climate-conscious tech workers, those who take on an organizer mindset. Sometimes, such tech workers organize around specific issues within their workplaces or publicly quit their jobs to pursue environmental goals. Sometimes, they are fired for speaking out about social or environmental issues. Sometimes, they write manifestos,⁹ appear on podcasts, and detail the tech industry's harms to the environment and to communities. Whistleblowers call out unethical, harmful, or illegal practices within their organizations, often driven by a sense of responsibility, justice, or concern for the public good, although whistleblowers' public condemnations of tech companies don't necessarily lead to structural change within those organizations.¹⁰

Once outside the strictures of tech companies, climate-conscious tech workers find other barriers. Public advocacy and grassroots organizing work can be quite different from the day-to-day practices of project management or technology development. The availability of resources, communication to management, and accessibility of data all evaporate once outside the corporate border, meaning that advocates like Holly and Will must embrace new theories of change. Very

often, they and others explained, this means the first step outside a company is attempting to reach back inside that company, to draw lines of influence and build new coalitions that bridge insiders and outsiders.

In the age of generative AI, tech companies are increasingly downplaying their environmental impacts through techniques of selective disclosure. This might mean, for instance, reporting emissions attached to their operations *without* factoring in their full supply chain, such as their contracts with oil and gas companies. They might omit their products' applications. However they are disguised, these lab-based metrics obscure AI's catastrophic repercussions for communities and ecosystems.

Through my interviews with tech workers across the industry and community activists on the ground, I try to reconcile these different perspectives. I ask:

1) How can the people who are designing, building, deploying, and regulating digital technologies draw connections between their mundane workflows — with attention to measurement, metrics, energy efficiency, and reporting — and the devastating long-term environmental and health impacts of AI technologies across their life cycle? and

2) What kinds of movements do climate-conscious tech workers participate in, and how are their strategies changing in this current political, social, and economic context?

What kinds of movements do climate-conscious tech workers participate in, and how are their strategies changing in this current political, social, and economic context?

Although policymakers, researchers, and journalists are increasingly attuned to the climate impacts of technology, the public conversation lacks an understanding of how to change the nature of technology production — how to shift power.¹¹ This report traces the barriers to implementing more environmentally sound approaches to development and deployment within tech companies. Through interviews and sustained engagements with tech workers across the industry, I explore the different ways that rank-and-file tech workers imagine themselves participating in environmental and climate justice organizing, connecting their struggles to local and transnational solidarity movements.¹² As an example of locations where such diverse coalitions form, data centers are sites where climate-conscious tech workers can use their insider knowledge to support local community resistance efforts; communities need actionable data to effectively negotiate with data center operators, utility companies, government officials, and other powerful actors.

The question of how tech workers organize against accelerating climate change and political hostility to climate-related work is important to ask, and important to ask *now*. Crucially, this report demonstrates that the rise of generative AI, data centers, and technofascism marks a pivotal moment for tech workers and community activism.¹³ Data centers, which power generative AI in addition to the entire social web, symbolize the tech industry’s material and environmental impacts. They are key spaces for contestation and resistance, where tech workers, researchers, policymakers, and grassroots organizations can work together to limit the harmful effects of tech’s growing power.

I unpack the stakes of climate advocacy during a time of AI ascendance. My research shows that the combination of generative AI and the recent political realignments of technology companies make it more difficult for workers to enact internal reforms through advocacy channels, instead pushing them into workplace organizing and cross-industry, grassroots environmental justice movements. However, this report also argues that the combination of external activism and the internal pressure coming from climate-conscious tech workers is deeply important to maintaining climate priorities during this current moment of technofascism.

The question of how tech workers organize against accelerating climate change and political hostility to climate-related work is important to ask, and important to ask now.

In Part I: Context, I define the current political moment and its relationship to energy and generative AI investments, showing how even corporate-sanctioned forms of sustainability work have become risky. In Part II: The Lab Mindset, I use interviews to trace how climate-conscious tech workers often become trapped in measurement regimes that don’t lead to meaningful change. In Interlude: Pivoting from Volunteerism to Activism, I show how climate-conscious tech workers are caught between company-sanctioned forms of volunteerism and deeper contributions that might call into question a company’s bottom line. In Part III: The Organizer Mindset, I describe how tech workers are joining in broader coalitions to gather viable counterdata that can push back against data center encroachment and corporate narratives. In the concluding section, I offer some recommendations toward building interdisciplinary movements that can hold tech’s power in check.

Part I: Context

The Risks of Climate Advocacy During AI Ascendance

Holly and Will's professional trajectory over the past several years captures several larger trends in the tech industry's relationship to climate concerns. Spurred by the 2015 Paris Agreement made at the UN Climate Change Conference, where countries agreed to work together to reduce emissions to keep global temperatures below an average 1.5 degrees Celsius increase, many large tech companies embraced public commitments to climate work. Most notably, many technology companies took *net zero pledges*, promising to drastically reduce their greenhouse gas emissions by shifting to renewable energy sources and decarbonizing their operations. It was during this period that Holly and Will were authorized to perform, and even celebrated for, their internal sustainability work.

But much has changed in a short time. Since this high-water mark of climate investment, tech companies have embraced generative AI tools, the US federal government has changed hands and set new priorities, and the tolerance for tech worker activism has plummeted. The result is that at a time when tech industry climate advocacy is most needed it is also riskier than it has been in years.

The Fervor for Data Centers

2025 is a moment of AI ascendance. Generative AI tools — typified by large language models (LLMs) — have inspired an incredible amount of public debate since ChatGPT was released in November 2022. This hyperbolic, wide-ranging AI discourse envisions workplace transformations, educational revolutions, and scientific innovations. Companies like Microsoft are cutting jobs to invest in AI, and even labor unions are partnering with companies like OpenAI to train workers on how to effectively use AI tools.¹⁴ AI ascendance is shaping government agencies, with Elon Musk's so-called Department of Government Efficiency (DOGE) using AI to justify the elimination of thousands of government jobs.¹⁵ In October 2025, Amazon announced a mass layoff of 30,000 white collar workers, the largest layoff in the company's history, ostensibly because of labor efficiency gains related to AI.¹⁶

At the same time, Amazon, through Amazon Web Services (AWS), owns the highest concentration of the world's data centers and is investing in rapidly expanding its data center footprint. Powerful technologists and politicians are emphasizing the importance of data centers to the enormous boom in AI technologies. AI systems, especially LLMs, require massive amounts of computing power to run

applications, train models, and handle workloads, known in AI circles as “compute.”¹⁷ Compute resources, in turn, require more data centers — facilities that contain computer systems that store and process data.¹⁸ These massive buildings draw from municipal supplies of electricity and water to power individual devices, mostly servers, networked together and maintained by IT professionals.



Image credit: © 2019 Chad Davis via Wikimedia Commons

In the United States, AI is increasingly seen as a way to establish and maintain global hegemony, which the Trump administration has used as an excuse to pull back environmental regulations on building both data centers and new energy infrastructures.¹⁹ Between the material costs of their construction and their considerable use of power and water for their operation, data centers have become the most substantial *physical and visible* footprint of the tech industry. The tech accelerationist push for data center proliferation and US energy dominance is therefore becoming one of the greatest challenges to mitigating climate disruptions at a critical time.²⁰

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The environmental threat of data centers has been understood for years.²¹ Initially, data centers were embraced during the rise of social platforms in the mid-00s; Google built its first hyperscaler

data center in The Dalles, Oregon, in 2006. And tech company leaders have explained how aggressive data center expansion has been part of the business model ever since.²² COVID-19 lockdown measures only accelerated this trend, as schools, workplaces, and public services all had sudden demand for digital infrastructure.²³ Though, it is misleading to claim that data centers have proliferated as demands for data have grown — in fact, media studies scholar Mél Hogan has argued that it is the availability of data center infrastructure that creates the demand for data, not the other way around.²⁴

Whatever fuels data center construction, corporate representatives have long tried to ameliorate the environmental cost by focusing on the issue of energy efficiency. Computer scientists and energy experts previously predicted that data centers would become more sustainable over time, as energy efficiency outpaced demand.^{25 26} But the substantial power required by generative AI and cryptocurrency changed these calculations. A 2024 report estimates that data centers already comprise 4.4 percent of the United States' energy consumption, and forecasts that data centers will use between 6.7 percent and 12 percent of electricity in the United States by 2028.²⁷

At their most extreme, corporate actors are responding to the changing energy predictions with new “moonshot” proposals. Some claim that the AI powered by these data centers will be so effective as to produce new scientific advancements that solve the energy crisis they help create. For example, in a *Nature* article, a sustainability lead at Microsoft argued that AI is essential for reaching net zero, despite the company's pivot away from such climate goals.²⁸ (The environmental justice organization Stand.Earth released a report that found that Microsoft's data center energy use will in fact surge 600 percent by 2030).²⁹ Other companies propose literally moving data center construction to the moon.³⁰

Back on earth, the Trump administration is already using accelerating AI and data center creation to throw new support to nuclear energy initiatives. This has become another source of investment for companies, including startups, and has led to the revival of previously shuttered nuclear plants.³¹ In many cases, there is no clear plan for when new energy sources would meet accelerating energy demands — and while the techno-optimists bet on nuclear, fossil fuels are used to fill the gap.

Data centers' environmental impact is also far more than a draw on energy infrastructure. The impacts of data centers and mining practices or water use and pollution are not unique to AI and must be considered relationally and historically.³² For instance, the data centers used by xAI's Grok, “a gigafactory of compute,” are located in Memphis, Tennessee; their fracking gas turbines contribute to air pollution in a historically Black neighborhood that already has high rates of asthma.³³ Similar scenarios are playing out across the US South, with communities of color pushing back against data center accelerationism.³⁴ Even in places with more environmental regulation, the story is much the same: In the Bayview-Hunters Point neighborhood of San Francisco, Novva advertises its sustainable data center, disregarding the area's history of environmental racism and current air quality issues.^{35 36 37}

Changing Priorities Inside Companies

Amid AI ascendance, other corporate priorities around climate and social issues have been cast aside. The climate pledges that tech companies made several years ago are already fading, with

several major companies admitting that their investments in AI are undermining their net zero goals. Google's emissions grew by 48 percent over five years because of AI.³⁸ Microsoft has stepped back from its net zero commitments, claiming that decarbonization itself was a moonshot project, one that is no longer feasible.³⁹ Even when companies were still abiding by their net zero pledges, they used a combination of tactics to avoid structural change. They financialized the carbon market, turning carbon reduction itself into an asset, while using corrupt carbon accounting practices with carbon offsets and Renewable Energy Certificates (RECs) to obfuscate their true environmental impact.⁴⁰ Perhaps the most egregious example of the dubious carbon market is the notion that "whales," which are huge carbon sinks, should be treated as financial assets.⁴¹ Along with creating new markets for carbon offsets, companies have even lobbied to change international standards like the GHG Protocol.⁴² Now, with the focus on AI, even these forms of theater seem less crucial. It is telling that Google recently removed the company's net zero goals from its website, indicating that net zero commitments are a relic of the past in an age of AI ascendance.⁴³ Net zero pledges were always voluntary commitments and are easily rescinded.

One senior technologist I spoke to marked this change emphatically:

I just don't see companies out of the goodness of their hearts saying we're gonna do the right thing, and in particular, with GenAI, if you notice that Google and Microsoft a few years ago were all in. They're like, 'Okay, we're going to have 24/7 access to green energy, and we're going to be carbon negative.' Now companies are saying they're not sure they're going to meet that by 2030 because GenAI has caused these companies to invest in a huge amount of new hardware, new infrastructure.

Sustainability practitioners within companies point to the problem of maintaining voluntary commitments to reducing emissions at a time when the industry is reorganizing itself around investments in AI.

Climate-conscious workers within companies are trying to bring product managers and chief technology officers back down to earth, highlighting the business and social value of sustainability even as companies set their eyes on speculative technologies just beyond the horizon. As Naomi, a designer at a large company told me, "I'm trying to think of how to say it without sounding cynical, but the company is very eager to capitalize on the AI movement, and so we sit with this conflict."

For climate-conscious tech workers, corporate and government investments in AI and energy not only undermine their work but make it riskier, especially for those on work visas. Even before Donald Trump's 2024 reelection, technology companies had begun cutting their sustainability teams (and publicly dismantling their diversity, equity, and inclusion [DEI] programs).⁴⁴ New US laws make environmental protection harder by repealing clean energy mandates, leading to speculation that the EU might walk back some of its AI regulations in turn.⁴⁵ A sustainability professional at a tech company said she was anxious after reading in the *Financial Times* about France suddenly not caring as much about corporate sustainability reporting directive (CSRD) reporting mandates after Trump's reelection. She believed that her job might be in jeopardy, especially because her role was intertwined with DEI and social justice roles at the company: "Maybe Europe won't save us after all," she lamented. DEI and climate concerns have become lightning rods, as specific terms are excised from corporate websites and federal agencies alike.⁴⁶

During the height of net zero pledges, employee-led groups for sustainability and marginalized identities were tolerated or even welcomed by tech companies, but that too has shifted. One user experience (UX) designer at a large tech company told me that a major consultancy firm had recommended abolishing the company’s employee resource groups and internal channels for sharing work around sustainability and social issues. There were no more identity-based groups, or even messaging systems for sharing work, and that included the sustainability working group and other more technically focused venues, as well as social fora. This was done to increase workers’ focus on “heads-down” work and to ensure greater productivity.

The political climate in tech has outwardly changed, even though there is a long history of right-wing ideologies in Silicon Valley.⁴⁷ Tech companies went from making climate pledges and supporting internal employee organizing around racial justice in 2020–2021 to laying off sustainability and DEI teams by 2023. Even just a few years ago, tech companies worked to express their progressive social values. It is hard to imagine from the perspective of 2025, but in 2022, when *Roe v. Wade* was overturned by the United States Supreme Court, Mark Zuckerberg claimed that Meta would pay for employees to have out-of-state abortions if they lived in states that limited access to abortion care.⁴⁸

AI ascendance has created a newly hostile and high-stakes landscape for climate-conscious tech workers

More recently at Google, No Tech For Apartheid activists were fired en masse after a direct action at the company’s Mountain View headquarters.⁴⁹ Corporate tech DEI efforts first established in the wake of the uprisings after George Floyd’s murder — often propelled by employee-led organizing efforts — are being dismantled or moved underground.⁵⁰ It is more dangerous for tech workers to push for climate action in their own workplaces in this context, especially for workers who are from marginalized backgrounds. But there is an opportunity to push for broader coalitions and step away from companies’ technocratic sustainability practices.

The examples above are all consequences of the intertwined explosion of support for AI and data centers, the expansion of which marks a turn away from other trends in corporate responsibility and government oversight. AI ascendance has created a newly hostile and high-stakes landscape for climate-conscious tech workers: Social and infrastructural investments in generative AI and data centers are significant new forces that must be identified, tracked, and (hopefully) thwarted.

Part II: The Lab Mindset of Climate Advocacy

According to the climate-conscious tech workers I spoke with for this study, there are many forms of climate activism — frequently, “sustainability efforts” — that they can pursue as part of their jobs. Some of these activities have been formalized roles for decades, and involve reporting to external accountability and standards bodies. Other efforts look a lot like traditional software design roles — working with small teams to create tools designed to be integrated into other workflows. Still others look like forms of community organizing inside or between companies, as workers connect with other concerned employees.

The vast majority of the climate work within companies, however, is deeply shaped by what I call the *lab mindset*. The lab mindset is an orientation to climate action that understands the issue as subject to technical problem-solving, specifically the form of technical problem-solving that structures other software work. Lab-minded climate work tends to prioritize quantitative measurement, energy efficiency, scalable solutions, and technical innovation.

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Ultimately, the lab mindset makes climate action manageable by tech companies, channeling the energy of concerned workers into changes that do not disrupt the marketing of data services, the expansion of data centers, or continued reliance on fossil fuels. Loup Cellard, Christine Parker, and Fiona Haines detail how AI is presented as a *pharmakon*, both a poison and a cure. Green AI discourses in the West tend to echo this argument, focusing on the power of new AI tools to balance the grid even while critiquing the environmental impacts of LLMs. Green AI focuses on quantitative assessments of the environmental impacts of AI to weigh their costs and benefits without acknowledging larger questions of political economy.⁵¹ Cellard, Parker, and Haines criticize the Green Software Foundation for focusing on decarbonization rather than the larger environmental destruction caused by the computing industry, both in historical and contemporary context. The measurement practices associated with green AI and decarbonization

software build on regimes of compliance and loopholes, which allow companies to use metrics to both claim and escape accountability. The lab mindset leads to the production of metrics and formalized reporting structures that underplay serious issues and disguise negative impacts.

Bureaucracies of Compliance: CSR and ESG

Corporations have organized their own workplaces around measuring and mitigating social and climate impacts across their supply chains through corporate social responsibility (CSR) reporting. Sustainability workers that want to enact change within corporations use CSR, Environmental, Social, and Governance (ESG) metrics, and responsible AI (RAI) frameworks.⁵² However, as the interviewees in this report share, these paradigms can fall short and are being further marginalized in the current economic and political climate.

Originally, CSR mandated that businesses regularly report on their activities that had an impact on society, such as charitable contributions, product safety, and human rights.⁵³ This required businesses to invest resources for measuring these activities, then making this data available to the public to enable accountability. Over decades of implementing CSR reports, corporations have learned how to bend them to the purpose of marketing — *buy from us, we're sustainable* — while ensuring that the process of measuring impact does not disturb their bottom line.

CSR initially became a common part of business culture in the 1970s, in response to government regulation around environmental and social impacts as well as vocal social movements. CSR reporting sets out a standard practice for publishing data about a range of societal impacts including greenhouse gas emissions, economic performance, and labor rights.⁵⁴ Much of CSR reporting is now structured by independent organizations which set the format and focus for businesses.⁵⁵ CSR metrics are reported quantitatively, using specific software programs and dashboards that track companies' activities like hours of employee volunteer time or parental leave policies to assess their commitment to social and environmental concerns.

Exactly which metrics are being tracked and reported on varies from year to year and corporation to corporation. While the Kyoto Protocol, an international treaty to set greenhouse gas emissions targets, was adopted in 1997, it was not actualized until 2005.⁵⁶ In 2006, the United Nations developed a bundle of metrics collected under the category of ESG.⁵⁷ As more companies signed on to ESG principles, there was an increased demand for ESG-related data, which led to new positions, responsibilities, and measurement practices within companies.⁵⁸ ESG has become a particularly privileged form of CSR reporting, and has been adopted by a subset of investors eager to advertise a commitment to “responsible investing.” The role of CSR and ESG in corporate strategy means that companies have shaped the practice to be focused on forms of measurement that are legible to investors and shareholders. The corporate understanding of CSR reporting as

52 Responsible AI is a set of principles or guidelines used to inform the design, development, deployment, and assessment of automated systems. Many large tech companies have dedicated responsible AI teams.

53 Climate-conscious tech workers I interviewed described their excitement around the early days of sustainability work in relation to CSR, where they found ways of talking to other companies and parts of the global supply chain to create a set of shared standards. So I don't want to totally discount the value of this kind of work, even if many workers eventually become disillusioned with the efficacy of CSR.

good for business has also led companies to include metrics on more and more criteria, not because of their effectiveness in sustainability, but because of the perception that they're marketable.

Ali, a longtime environmental scientist within a large tech company with a background in industrial settings and data centers, noted that when people refer to sustainability, "we're really talking about sustainable development, versus a buzzword that causes people to flip out." He went on to say that ESG was problematic in a similar way:

The problem with ESG is you've put too many things together, and therefore they all suffer together. It makes it much easier to dismiss it, to politicize it, to put people that have no idea of what the hell they're doing operationally and tactically in there. What I find is many of the ESG heads have never done what I consider work. Have you ever run a plant? No, okay, what about air permitting? No? All right, what have you done? Have you done topography studies, or LCAs [life cycle assessments]? There's a lot of people that are awesome at marketing. They're beautiful, eloquent speakers, which I admire. But I also get frustrated when I ask them, what are you actually trying to do?

Ali felt as though compliance directives created by policymakers without technical knowledge were impossible to follow, a sentiment I heard echoed in other interviews. I encountered similar arguments from other green developers and technologists, who thought the conflation of environmental and social impacts was a mistake.

Tools of the Lab Mindset

For climate-conscious tech workers, the fastest growing trend in technological climate solutions has been a collection of methods organized under the banner of *green software*. Emerging from developer cultures at companies like Microsoft and Google, advocates of green software emphasize the need for open source tools and workplace practices that improve energy efficiency and carbon awareness in computing.⁵⁹ These tools can show developers how AI models relate to local energy grids, some cleaner than others, depending on location and time of day, enabling choices that reduce environmental impact. To proponents, these tools, including data visualizations and telemetry (data collected and analyzed from remote sources), can help developers make more informed decisions and shrink their carbon footprint. Green software measures the carbon costs of computational tasks, with an emphasis on efficiently using cleaner sources of renewable energy.⁶⁰ For example, Green Web Foundation created a tool called CO2.js that helps developers estimate the emissions of the websites, apps, and software they use.⁶¹ In theory, developers can use real-time data from websites like Electricity Maps or WattTime, which provide maps highlighting the carbon intensity of the energy grid for different regions at different times of day.⁶² The idea behind these software tools is that individual developers can better understand their relationship to the energy grid and make greener decisions about how they build their websites and when they train their AI models, focusing on the individual priorities of lone developers in lab-like environments.

Software for tracking progress toward climate goals also exists at an organizational level. For example, carbon accounting software like Watershed helps companies track the emissions associated with the products they purchase.⁶³ Companies use net zero dashboards that show the environmental footprint of their operations with graphs and other data visualization artifacts.

Melissa Gregg and Yolande Strengers argue that the dashboard is a holdover from petroculture, or the omnipresence of oil and its byproducts in everyday life, in maintaining productivity no matter the cost.⁶⁴ Failures are absorbed by individuals, but there is no corporate accountability: “Over time, if a sustainability goal is not on course, the worst outcome is that a team-member may face a loss at annual bonus time. But the environmental damage arising from a failed commitment goes unrecorded.”⁶⁵ By gamifying sustainability through dashboards, no real progress is made, similar to how an individualized carbon footprint places the blame on consumers rather than on the fossil fuel industry.⁶⁶

The lab mindset’s focus on measurement continues the tradition of quantitative reporting from CSR and ESG. Green software builds on historical trends in green computing, or attempts at making IT more energy efficient, related to the birth of the Environmental Protection Agency’s Energy Star program in 1992. With the industry’s recognition that efficiency was no longer increasing in relation to computational power, bucking the assumptions of Moore’s Law (the theory that computing power and performance would double every two years), new standards for energy efficiency were devised, including the concept of performance per watt.⁶⁷ Green computing also goes beyond energy efficiency to include CSR practices: reducing the environmental footprint of computing across the life cycle and value chain by minimizing hazardous materials and waste, conserving water and other resources, and recycling and reusing obsolete products.⁶⁸ Green software starts from the fundamental assumption that computing work will continue to accelerate and require more resources, but it attempts to measure this demand to support rational decisions in the most efficient way possible.

Green software tools are not used by default, and it is individual developers who must advocate for their use within their workplaces.

To fit into the familiar molds allowed by corporations, green software projects often prioritize measuring energy use, providing metrics that can be used as a representation of efficiency or demonstrate progress toward net zero goals.⁶⁹ Internally developed green software tools can also be sold to customers that are interested in tracking their own emissions. The lab mindset ensures a pathway to C-suite attention and company support, as their metrics and good PR can justify these efforts as part of marketing materials, organizational goals, and tangible aspects of product development.

69 Reporting usually includes Scope 1,2, and 3 emissions, although each company has a different method. Scope 1 emissions are emissions that a company directly controls, Scope 2 are indirect emissions from the energy it uses, and Scope 3 emissions are indirect emissions both upstream and downstream across the value chain, including emissions from a company’s customers. Companies tend to report on the emissions connected to their operations rather than attempting to calculate the emissions attached to their products’ use or applications, which is why activists like Holly and Will Alpine are advocating for enabled emissions to be part of the equation.

70 Emanuel Moss and Jacob Metcalf, “Ethics Owners: A New Model of Organizational Responsibility in Data-Driven Technology Companies,” Data & Society report, September 23, 2020, <https://datasociety.net/library/ethics-owners/>

As with responsible AI workers and other ethics owners within tech companies, it is often individuals who advocate for change within their organizations and who find ways of participating in green software even outside of their official job roles.⁷⁰ Green software tools are not used by default, and it is individual developers who must advocate for their use within their workplaces. The green software movement can largely be traced to the influence of small groups of software developers working at major companies. In 2021, representatives from Microsoft, Accenture, GitHub, and ThoughtWorks launched the Green Software Foundation. The Green Software Foundation declares its mission to “reduce the total change in global carbon emissions associated with software.”⁷¹ Green software encompasses a description of methods, a specialty assigned to certain technologists, and a friendly marketing term to describe corporate sustainability efforts.

Researchers Janna Huang, Angèle Christin, and Sanna Ali compare sustainability work and responsible AI (RAI) work within companies.⁷² Executive leaders may care more about sustainability insofar as it relates to compliance, which is typically measured through metrics.⁷³ But corporate leadership’s emphasis on metrics can limit more holistic approaches to thinking about environmental impacts and implementing actual structural changes. They write, “Although metrics are pivotal for monitoring and transparency, sustainability workers point out that without a coordinated effort across the entire organization to translate data into meaningful interventions — and the organizational will to support them — measurement alone will fail to close the gap between corporate ambition and tangible environmental impact.”⁷⁴ David GrayWidder and Dawn Nafus similarly argue that AI practitioners’ focus on checklists can make it difficult for them to keep the whole AI supply chain within sight, dislocating their sense of accountability.⁷⁵

Technologists have devised different frameworks and models for understanding both the direct and indirect effects of AI systems, attempting to include more holistic assessment criteria.⁷⁶ Different approaches examine the energy and carbon costs of training AI models, of inference, or of their full life cycle, which includes the energy and carbon costs from resource extraction and hardware manufacturing to application and use case.⁷⁷ When reporting on their emissions, companies rarely factor in their customers’ emissions and downstream effects, like the emissions connected to military or oil and gas contracts. Other technologists have focused on calculating the water cost of AI systems.⁷⁸ There are not yet well-established standards and methodologies for measuring the environmental impacts of AI, but open source projects like CodeCarbon offer one possible tool that developers can use. CodeCarbon, created by researchers at Mila, Boston Consulting Group, Comet, and Haverford College, offers an open source package that integrates into a codebase to help developers estimate the carbon dioxide emitted from executing their code.⁷⁹ Another initiative at Hugging Face aims to be an Energy Star-like rating for AI models, the AI Energy Score, which was launched in early 2025, helping developers track the energy intensity of different models.⁸⁰

Such forms of measurement might be welcomed by corporate leaders, who pay attention to hard numbers and their relationship to financial markets, but there are certain aspects of the work that get left out of the picture. Abigail, who has worked in sustainability in both corporate tech and government contexts, spoke to the dilemma of measuring or financializing the survival of ecosystems:

I can now have that conversation in a way that does not require me to have a shared value system with my CFO, or the head of engineering, because we can just safely talk about it in terms of KPIs and megawatt hours and all of these easy-to-understand metrics and numbers, which is what the business community

is used to. The limitation of that, though, is that I don't think everything can be financialized, especially if I think about nature and biodiversity. How can you put a dollar value on preventing the species from going extinct or a community having potable water? Financializing these systems is not the right framework.

Because of their relationship to business interests, energy efficiency and "AI for climate" as a product are the main priorities of many large tech companies. Customers do want software products that can track carbon intensity because efficiency is a matter of cost savings. Management is more willing to put resources into this kind of product since it's something that customers explicitly ask about, but then management focuses on energy efficiency at the expense of other sustainability indicators that are harder to quantify.⁸¹

Boxi Wu, a former RAI practitioner at DeepMind, said the most visible initiatives involving sustainability at their company were focused on improving data center efficiency through machine learning, or advancing sustainability related causes like weather prediction or fusion technology:

RAI in practice typically focuses on data and model level analyses of ethical issues, and societal biases and harms, based on the company's AI principles, which don't explicitly mention environmental impacts or sustainability concerns. This can make it difficult to include environmental impacts in ethics discussions and assessments, as they can rarely be isolated to one dataset, model or project, and often require a broader supply chain analysis.

Boxi went on to say:

But sustainability at the model level, either carbon accounting or the broader extraction of the supply chain, is difficult to integrate into the institutional structure of RAI or ethics assessments and governance, given that such issues are difficult to address through a data, model, or project level technical mitigation, and often require systemic changes to the industry's incentives.

The lab mindset is ultimately technosolutionist and allows climate-conscious tech workers to start software projects without addressing these more sociotechnical elements of their environmental impacts.

Measurement Is a Trap

Green technologists within companies pointed to the general problem of measurement. Even lab mindset practitioners admit that their measurements are almost always loose estimates and not necessarily accurate. As researchers within tech companies describe, much of the work of measuring the energy consumption of an AI system is an act of estimation, especially when calculating the impact of an entire network.⁸² One team at a large tech company was integrating carbon awareness into the company's rollout of generative AI, but the measurement itself wasn't accurate. As one technologist involved with the project put it, "Measurement freaking sucks. Everyone thinks they want it and they think they have the number, but they really don't. An estimate is hard, and then everybody says it's bullshit, but there is an overdeveloped impulse to measure."

One problem is that developers are not always sure what elements they should be measuring in the first place. As many of the experts I interviewed noted, while energy has received the most attention from the tech press and policymakers, water use is another major issue associated with AI. However, the methods for assessing water use and pollution are not equivalent to the methods used to produce energy metrics.⁸³ As discussed earlier, technology companies have increased their global water consumption due to data center expansion. However, *how much* water is being used is not transparent, so many researchers have attempted to estimate the water cost of AI systems.⁸⁴

One sustainability worker at an industry association feared that too many industry leaders assumed that water pollution and consumption could be solved using the same model as they used with emissions: “Water quantity and quality issues play off each other, and there are tradeoffs. If you reduce the amount of water you’re using and discharging into a river, that may mean that what you’re discharging has a higher concentration of pollutants. So you created a problem, because you may then be out of compliance.”

Such tradeoffs are not always captured by the software used in impact assessments. Developers use tools like LCA, carbon footprinting, and other carbon accounting tools to measure environmental impact.⁸⁵ As a developer based in Finland, who is the chair of an industry association on green computing, said:

It’s so interconnected, and it’s so networked, that it’s hard to get a comprehensive picture, and sometimes the optimization in one place might cause un-optimization somewhere else. And it’s that kind of wicked problem, there are no easy solutions. I think that measurement tools are in their infancy.



Submer Immersion Cooling, [CC BY-SA 4.0](#), via Wikimedia Commons

Even the best measurement tools are limited in their effectiveness, however, if developers don't use them at all. Critical UX researchers and designers study how carbon-aware technologies are taken up within organizations and how they are integrated with tasks throughout the course of a workday.⁸⁶ What does it look like to actually do this kind of measurement within a company? Who has decision-making power? As many climate-conscious workers told me, individuals were often put in uncomfortable positions in having to advocate for greener practices that might be at odds with management's business priorities. Even with a software tool for implementing carbon-aware practices, developers did not always find such tools easy to use or to incorporate into their workflows. One technologist at a major tech company said that it is hard to persuade AI developers to pull CodeCarbon, the open source package mentioned previously, off the shelf and use it because "CodeCarbon is actually a lot of work." For developers who are under time pressure, carbon awareness is hard to prioritize if they do not have supportive managers or other reporting constraints. A theory of change that relies on measurement informing voluntary moderation, i.e., "please use this CarbonTool and run queries at optimal times," is not effective in part because it fails to recognize the labor conditions of developers.

And it's that kind of wicked problem, there are no easy solutions.

Because of time pressures within tech production, corporations use objectives and key results (OKRs) and key performance indicators (KPIs) to prioritize certain projects and evaluate individual and team performance.⁸⁷ Climate-conscious tech workers described how rapid reorganization and mass layoffs, along with companies' investment in generative AI, changed their workplaces. Some drew connections between OKRs in a corporate setting and the increasing pressure to use generative AI in workflows while applying an OKR-like metric to sustainability in general.⁸⁸ Old OKRs and KPIs around sustainability, at both an individual and organizational level, are thrown out to accommodate new ones that include AI.

Penelope, a UX designer at a large tech company, noted that generative AI-focused OKRs had overtaken OKRs around sustainability and other responsible development goals:

At work now, there's obviously tons of emphasis on using generative AI, and even reporting how your team is utilizing generative AI, almost as a [n] OKR, that you are maximizing all opportunities to use generative AI. And what's tough in that environment is when there is no real corporate goal linked to sustainability, or an OKR that everybody at the individual level is responsible for. It is very hard when it feels like somebody's performance evaluation, their paycheck, all of their career advancement, is tied to a key result of using generative AI more.

Using generative AI is now a metric for assessing a worker's productivity, meaning that employees are being asked to use an energy-intensive tool that undermines companies' larger sustainability goals. The so-called labor efficiency promised by AI is now prioritized over energy efficiency as a source of value.

Technologists expressed skepticism about the relationship between measurement, even accurate measurement, and prioritizing emission reduction, which would require limiting resource demand and transitioning away from fossil fuels. As one senior technologist at a tech company put it: “You can build yourself a nice little rabbit hole of how to measure and just spend five years trying to figure that out and not actually make any reductions at all.”

The so-called labor efficiency promised by AI is now prioritized over energy efficiency as a source of value.

She was frustrated that her company was focused on measurement at the model level, which assesses how much energy a particular LLM uses in training and inference, rather than the larger systemic relationship with the power grid:

I think there’s an interesting other side of the policy equation which has nothing to do with tech or AI or any of it, but it has everything to do with the power grid. There’s a physical upper bound to data center buildout. And municipalities are starting to say, we are power limited, go away. The data center industry is freaking out, right? Like Ireland’s policy to say, “All right, if we are threatened by blackouts, we’re cutting down the power to half; to all the data centers, there is only so much power, and you’re only going to get so much.” That, to my mind, is where the power of the policy action is, not the “Can you measure your model?” crap.

The real politics of AI’s resource consumption plays out in cities and regions, as utility companies, water boards, local governments, and data center operators determine how power and water are used. Such impacts require more relational and geographically specific forms of measurement with attention to environmental justice concerns.⁸⁹

Ultimately, measurements can always be manipulated, foreclosing real action by focusing developers’ attention on incremental tweaks or CSR professionals’ attention on tracking software and dashboards, both of which can suck energy away from more systemic forms of change. At Intel, I saw how our initial team focused on circularity and more holistic interpretations of sustainability morphed into a green software team dedicated to building green developer clouds and money-making products that would please the chief technology officer (CTO), who wanted us to deliver on a billion-dollar green software concept.

As we will see in the next sections, many climate-conscious tech workers eventually tire of lab-based metrics and attempt to find like-minded coworkers through workplace organizing, sometimes pushing their employers to take on tangible climate goals or forming connections with grassroots organizations while volunteering their time. I refer to this as a part of the organizer mindset.

Interlude: Pivoting from Volunteerism to Activism

It is often in the murky space between the lab mindset and the organizer mindset in which climate-conscious tech workers begin to change their strategies, shifting from company-sanctioned employee groups and measurement practices to workplace organizing. Climate-conscious tech workers take on volunteer work within their workplaces, often facing opposition or failure. While this volunteer work is sometimes sanctioned by companies, it can quickly become threatening to a company's bottom line and public presentation if it goes too far. Companies often welcome internal volunteer efforts, but sometimes sanctioned employee activities give way to adversarial workplace organizing, where workers write petitions, circulate pledges, and ask shareholders to take a stand.

For climate-conscious tech workers, daily workflows and volunteer time often interconnect. At Intel, part of my job on the green software team was to start an employee resource group based on the successful group cofounded by Holly Alpine and Drew Wilkinson at Microsoft.⁹⁰ My manager at that time, a senior software developer, introduced me to Drew Wilkinson via LinkedIn. Drew Wilkinson argued that everyone can engage in climate work, whether or not it is part of their official job title. He now presents “Every Job is a Climate Job” at venues like SF Climate Week, at universities, and at other large tech companies. His internal volunteer work at Microsoft helped him transition into a form of entrepreneurialism, enlisting climate-conscious tech workers at other companies to start their own employee resource groups or informal initiatives around sustainability.⁹¹

In the previous section, I documented how corporate-approved sustainability efforts — most notably green software development — prioritize measurement, efficiency, and reporting, often to the detriment of more holistic approaches. For climate-conscious tech workers who want to consider the material costs from an entire supply chain, tech's place-based harms, or strategies for slowing or reversing data center development, the options available for them within corporations exist in a murky gray area of *volunteerism*. For example, while employed at Intel on a sustainability team, which turned into a green software product team after management's

90 It's worth noting that Mel Gregg explicitly hired me into my position, which focused on green software developer cultures and climate action in the tech industry, because of my organizing background and existing relationship with the Tech Workers Coalition.

91 Drew's career trajectory shows that there is still a market for the topic of sustainability, even if it is being suppressed by the tech industry. Some former tech workers even sell services consulting on how to “pivot to climate” within companies for other climate concerned tech workers. While done from the outside, such consulting practices hew much more closely to the lab mindset of managed volunteerism than organizing work.

priorities shifted, I joined the policy working group of Green Software Foundation as part of my job. It was a form of volunteerism, but performed during my working hours. When I was laid off from my job at Intel, I continued on as a contractor for Green Software Foundation, paid by the hour for work I had previously done as part of my highly compensated tech worker salary. In my report on the state of green software, written as part of my contract position, I struggled to find reasons why the C-suite should invest in green software and sustainability in general, along with responsible AI practices, while trying to emphasize the business value of such initiatives. I also used a McKinsey study to argue that employee resource groups for sustainability would help attract and retain young, talented employees.

Climate-conscious tech workers do derive a number of benefits from internal volunteer opportunities, but there are also drawbacks. Employees must balance adhering to a company's business goals and taking part in grassroots efforts led by volunteers. Other workers described how sustainability efforts were intermingled with identity-based employee initiatives. In many cases, relying on volunteers is not sustainable or scalable, and people can get burned out. This is especially true in a period where companies are deprioritizing climate commitments, accelerating AI adoption, and restructuring their staff.

In many cases, relying on volunteers is not sustainable or scalable, and people can get burned out.

Given these limitations, what does climate-conscious volunteerism actually look like in practice? How do tech workers find each other and initiate climate-related projects, and how effective are they in realizing their goals?

Technical Side Projects

For a number of climate-conscious tech workers, internal volunteerism takes the form of getting approval for technical side projects. This form of volunteerism is closest to the forms of software and dashboard development at the heart of green software or CSR reporting, and is often justified by adopting a framework of innovation — technologists working with their technical skills to produce new “breakthroughs.” Some companies build such work into people's jobs, giving them 10 percent flexibility to work on whatever sustainability issues interest them, even building it into performance reviews, individual OKRs, and KPIs. According to sustainability practitioners, green products from companies like Google and Microsoft are the result of “passionate volunteer” developers.

Side projects can be focused on technical problems that are the tip of the iceberg, doing little to effect systemic change. Some workers discussed their strategies for pushing for their companies to expand their sustainability focus to new areas.

Naomi described her company's approach to sustainability, which follows established ESG reporting norms but fails to consider the company's digital footprint, meaning the carbon cost and other

environmental impacts of the software workers use internally and how the company stores data. In response, Naomi and a colleague started a worker-led organization at the company to address the company's digital operations. At a very large company, even if digital operations are only 1 percent of the company's emissions, reducing this impact can matter at scale. They started with coworker engagement, encouraging colleagues to think about their digital footprint, reducing waste when building products or tools. Their proposed actions focused on "small steps that employees can take, like when they create internal presentations, deleting the multiple versions of the slide decks they don't actually need." While this might seem like an infinitesimally small step toward dealing with such a massive problem, and one that emphasizes personal responsibility rather than organizational change, Naomi said that this was a way of sowing seeds.⁹² Within corporate settings in a time of AI ascendance, advocate-led recommendations for cutting waste can feel daring, or even personally risky.

While some managers or internal groups might be willing to integrate sustainability goals into KPIs or performance reviews, it can be difficult for this to become company-wide policy without real support at the upper management level. There is a tension between the idea of a green developer who is doing things on their own time, a kind of tinkerer, hacker, or DIY position that upholds technological genius as a product of concentrated effort and singular action, and the reality that implementation within tech organizations requires cross-team collaboration and cross-enterprise communication. Even the best ideas need management's buy-in and budgetary approval to be successful.

When technical projects are approved and developed, it is never guaranteed that they will actually be taken up and used effectively. Ashby, who works for a smaller startup, described doing work in response to customer requests for carbon emissions data. The startup held an annual hackathon, where employees formed groups around proposals and teams tried to implement an idea in a week. Ashby's team worked on an observability tool to monitor the energy and carbon status of software development kit (SDK) products on individual machines. Data from Kubernetes bots would be able to indicate how much compute they were using, from where, and at what time of day, so customers could be more aware of their emissions. As Ashby put it, "there is so much abstraction in computing," and this tool was a way of combating the disconnect between power plants and energy use from software tools.

Despite the fact that customers asked for such a tool, management did not prioritize it because they were not especially focused on climate. It was only a viable product if there was a strong regulatory need, or out of the "goodness of their hearts." With the regulatory changes in the European Union, like CSRD, there was more of a downstream market for the tool. But Ashby also noted that she personally has other causes to focus on, as a trans person who cares about finding and fostering an inclusive workplace. Ultimately, without strong bottom-up support *and* management's investments, the hackathon project would not be viable.

Authorized Advocacy

Some tech companies allow climate-conscious workers to not only start or contribute to internal volunteerism efforts, but actually participate in efforts outside the company. Apps like Benevity help large companies track how their employees are spending their volunteer time, which is then used for ESG reporting. Large companies encourage their employees to participate in volunteer

days to support their metrics. One worker at a large tech company with offices in the Midwest told me that many employees volunteered for environmental justice nonprofits in Detroit, even if management was also concerned that volunteering might distract them from their main jobs. While the company encouraged employees to participate, management was ambivalent about the potential drain on productivity.

Sometimes the line between cross-industry associations and public-facing nonprofits can be blurry. Both can become spaces for sharing work and producing a new community of practice. Naomi pointed to other groups that served as a source of inspiration, mentioning Climate Action Tech, Microsoft's sustainability community, and Green Web Foundation.⁹³ Green Software Foundation has called into question the efficacy of energy efficiency in the face of endlessly growing energy demand, offering a political point of view.⁹⁴ As a designer, Naomi appreciated the aesthetic of Climate Action Tech and Green Web Foundation's publication, *Branch Magazine*.⁹⁵ She also liked the fact that Green Web Foundation speaks out about political and labor issues, such as when WordPress cut its sustainability team.⁹⁶

Naomi said it was helpful to see small groups focused on greening web design "because without these, you just feel so alone, and you almost don't really know what a smart next step would be. And I feel like seeing what other people have done, how they failed and what succeeded, gives me also the vocabulary to plan. Otherwise it'd be, you know, groping in the dark and trying to figure out things from scratch. And ... I don't think we have enough time for that."

Climate-conscious tech workers are not only directed to internal groups. Frequently companies will facilitate participation in industry associations, which focus on large industry sectors, e.g., semiconductors. Such associations often house internal working groups focused on particular areas of concern, including climate. While companies sometimes send their employees to these convenings, they are also considered outside of working hours. Volunteers are often delegated to attend industry association working groups by a more senior manager, and sometimes individuals are participating in multiple working groups, all in addition to their 40-hour work week. These industry associations are significant because they are one way that employees can move beyond the strict confines of their company to make connections for more effective sustainability work.

Evangelism depends on "soft" skills and effective communication, such as the ability to present a compelling PowerPoint within a company or talk at an industry conference.

Practitioners described the process of finding like-minded individuals. In the case of Naomi (a designer) and her collaborator (an engineer), their differing skillsets and networks helped them find people to recruit. Much of this, as with any social movement-related effort, depends on a degree of personal charisma and organizing skills. In the context of tech companies, this kind of social dynamic is referred to as *evangelism*, as individuals work to advocate for specific technologies and make them part of an organization or industry-wide standard. Evangelism depends on

“soft” skills and effective communication, such as the ability to present a compelling PowerPoint within a company or talk at an industry conference. Evangelism, like whistleblowing, is often attached to an individual, but many climate-conscious tech workers also participate in workplace organizing, which involves collective action around a specific cause that can also be tied to broader unionization efforts and political work. Workers who at one point were focused on carbon awareness and measuring models might at another time be involved in larger movements to push tech companies on climate issues.

Identity, Employee Groups, and Emergent Activism

Employee resource groups (ERGs), or worker-led affinity groups within organizations, are a long-standing feature of tech companies — often working to provide good PR that a company is taking social issues seriously. The workers I interviewed said that participating in or creating such groups was a large part of how they pursued internal sustainability work and that the ability to network and find like-minded colleagues was often critical.

ERGs originated in the social movements of the 1960s and 1970s. The National Black Employees Caucus at Xerox was started in 1970 and HP’s Gay, Lesbian, and Bisexual Employee Network (GLEN) was founded in 1978.⁹⁷ Today, many companies have identity-based groups, with some affinity groups for employees who are passionate about the environment or other causes. Many tech companies now house climate-oriented ERGs, sometimes including space for more technical topics like green software or responsible AI, that serve as centers of gravity for today’s climate-conscious workers. ERGs provide space for employees to pursue goals that are important to them, but they are also allowed by corporations because they perform various functions for the organization. For one, they help siphon energy away from unionizing campaigns.⁹⁸ ERGs encourage various kinds of volunteer labor for the organization while acting as an extension of corporate marketing and PR, a form of ethics washing.

As numerous interviewees noted, there is an often fuzzy boundary between the volunteer work associated with worker-led groups and formal job responsibilities. The gendered, racialized labor of the critics within tech companies is tied to cultures and histories of volunteerism within DEI movements. Responsible AI, ethics, and sustainability workers within tech companies, who are often from marginalized communities and are performing work that is institutionally marginalized, may put themselves at risk if they speak out.⁹⁹ Furthermore, their work within companies may be deprioritized and it may be difficult for such workers to account for their own productivity and impact via established performance metrics.¹⁰⁰

Several of my interviewees launched sustainability groups for employees at their companies while also engaging in cross-sector advocacy work. Lila, a designer at a major tech company, became involved in climate activism through Extinction Rebellion and later began organizing within her workplace. She connected with colleagues through an internal sustainability community, hosted talks and events, and eventually helped launch a climate pledge for workers across the tech sector. From there, she came across the Climate Action Tech community, an international online organization of tech workers who want to contribute to climate change mitigation. She started a lab for green design at her company, an idea that began as a hackathon project. She developed a sustainability scorecard for designers, and several of her collaborators later helped create a set of green design principles that were adopted and featured on the company’s website.

While many technologists are able to find and create strong connections through such voluntary groups and organizations, there remain a number of uneasy tensions. A common refrain among practitioners was that placing sustainability efforts in the same structure as voluntary identity or affinity groups inequitably shifts the burden of this work on various marginalized groups. This includes (but is not limited to): women, queer and trans people, BIPOC people, and disabled people. The result is an even greater chance of fatigue and burnout, as extra labor is required of those who already have less access to privilege and other forms of accommodation.

A high percentage of the people I interviewed for this report are women, and this coincides with the gendered division of ethics labor within tech companies. As one practitioner put it:

Someone on a sustainability working group call said, ‘I’ve worked here for 30 years, and this is the first phone call where I’ve been the only man.’ And anyway, that has stuck with me. It took him 30 years to be the only man on the phone when we are often the only woman on a call, and it was in the context of sustainability.

BIPOC practitioners observed that sustainability spaces, especially in tech, tended to be overwhelmingly white. Jared, who started a climate justice industry association group, noted that the communities most affected by the tech industry are not necessarily talking about it in environmental terms. “You don’t have enough underserved communities that feel included in this sort of green space. There are very few Black sustainability professionals, for example,” he said.

The result is an even greater chance of fatigue and burnout, as extra labor is required of those who already have less access to privilege and other forms of accommodation.

As Jared put it, a developer focused on decarbonization might not be connecting the dots between the work he is doing in the lab and the communities he lives near, or the communities that live near data centers. With the rise of ESG reporting and the start of the CHIPS Act in 2022, Jared saw an “opportunity to build a home for people to care about issues like climate equity and climate justice, environmental education, youth engagement, and then to build space for folks to collaborate on projects.” He invited a local nonprofit that provides refurbished computers to underserved communities to a tech conference to present to ERGs from different companies.

While working at Intel, gender theorist Mel Gregg was involved in launching a senior advisory group for queer employees, the Out and Ally Leadership Council (of which I was a member), and worked in many different ways to leverage her position in the company to advocate for causes she believed in:

So I personally did what they say, “put my badge on the table,” and used my leverage in the company to say that I think sustainability needs to be a priority. And that created something of a groundswell of interest that then created some

noise, to add weight to other, more formal pressure that the company was under, to have a net zero pledge. And following the net zero announcement, I had been given some latitude to have special projects in the personal computing group to do investigations of circular economy, reuse, and secondary markets as part of a sustainability play.

Mel used her seniority to push the company toward a more holistic approach to sustainability, going beyond CSR reports to think about circular design and reuse, which are less likely to be prioritized because they may not directly or clearly help the bottom line of most companies.¹⁰¹ That is, to sell more things to more people in shorter amounts of time. She also strove to connect social impact and responsibility to climate issues within the company, making them both priorities for technologists.

My response was not rallying and creating a movement. My response was to cry

But AI ascendance has also made it more difficult for workers to continue internal advocacy work. When I spoke to Lila in the summer of 2024, green design had less traction at her company than it previously did. She said that everyone was under stress:

The pressure is so enormous right now, with both getting AI into every product that we can, which is its own problem. But we'll park that for now. And then with the layoffs, and lots of reorgs within the company, because we need to restructure with the AI angle as well, that has led to a general level of exhaustion, which is why, at the moment, the interest for this kind of work is very low and the capacity for this kind of work is very low.

Changing working conditions affected workers' ability to participate in volunteer efforts around sustainability, even when it was tied to internal products. Other practitioners expressed similar feelings of hitting a wall in a time when all of the focus was on AI: "You've got this energy-sucking technology that nobody needs that's putting pressure on the energy grid. My response was not rallying and creating a movement. My response was to cry." Many of these moments, coupled with a growing awareness of other groups and an acknowledgment of burnout, have led technologists to ultimately leave their jobs to instead take up work with advocacy groups. As we will see in the next section, this shift is part of taking on *the organizer mindset*.

101 Circularity can sometimes be paired with business incentives, at least in limited ways. Ali mentioned that he was able to advocate for the reuse of critical minerals because he was able to demonstrate a cost savings, which incentivized senior leadership.

Part III: The Organizer Mindset: Grassroots Connections to Environmental Justice

Some climate-conscious tech workers with whom I spoke realized that the lab mindset had become deeply embedded in both their own work and overall tech company culture. Many described the process of embracing another mindset — what I’ll call an *organizer mindset* — that required a different approach to climate action. Within the tech industry, the organizer mindset prioritizes qualitative measurement, holistic impact evaluation, intersectional and local interventions, media coordination, and productive refusal.

Within the tech industry, the organizer mindset prioritizes qualitative measurement, holistic impact evaluation, intersectional and local interventions, media coordination, and productive refusal.

One of the clearest stories of the organizer mindset I heard was from Eliza Pan. Eliza worked at Amazon where she tried to move internally to join their sustainability team. Unfortunately for Eliza, the team did not “have headcount” and therefore couldn’t bring her on. However, the team told Eliza that she *could* attend meetings and help them make the case for sustainability to their business partners, even if she couldn’t be an official part of the team. Eliza eventually became frustrated with these efforts: “Sustainability was not a priority, and we were having to fight at every opportunity to get people to care about it, basically because it wasn’t a business priority. It felt like playing in the margins.”

Serendipitously, Eliza found another outlet for her energy:

I got an email to my work email asking “Does anyone want to talk about climate change?” I ended up in a meeting with 15 other people who worked at Amazon. We had launched the sustainability ambassadors program. The sustainability org was saying we needed ambassadors to make the case for sustainability in every part of the corporation. The woman who worked for the sustainability org was also in that meeting; she proposed that project ambassadors could improve recycling efforts

on every team. The energy got completely co-opted into separating trash so that Amazon offices would have cleaner recycling streams. We were kept in the sandbox and not allowed to do anything that would challenge the business metrics.

Eliza, along with other practitioners I interviewed, were dismayed by how internal sustainability proponents could get sidetracked by small projects or in some cases be appeased by a company's climate commitments that did not threaten the company's business priorities. And here is the crucial development: Frustrated by this dead end, some members of Eliza's group started meeting outside of the company, in coffee shops and living rooms. Outside the confines of working hours and connecting more directly with like-minded individuals, these informal meetings turned formal. Eliza and her group eventually rebranded as Amazon Employees for Climate Justice and in so doing embraced new methods for making change.

Eliza's trajectory is not so different from that of Holly and Will Alpine. After hitting a wall with internal, metrics-based reforms, some climate-conscious tech workers turn to workplace organizing or leave their corporate jobs and move into wider political organizing and coalition building, taking on volunteer work as part of civic tech projects. What does climate work look like when freed from the lab mindset? It can look like organizing fellow tech workers to sign petitions and providing roadmaps for how to push for more robust corporate sustainability measures. It can also look like grassroots activism, connecting with local environmental justice groups and labor organizations to push for sector-wide change and the reimagining of tech altogether.

In this section, I describe the forms of connection that nourish this organizer mindset within the tech industry, while also describing the challenges that plague work from the outside. I document how the work guided by the organizer mindset moves away from individual contributions and corporate capture through OKRs, instead making demands on employers through mass resistance, public callouts, and internal organizing work. Throughout this, I identify the crisis of *viable counterdata*, where climate activists must struggle to bring their data to bear in ways that companies, regulators, or communities will recognize and act on.

Situating Environmental Justice in Tech

Tech workers have engaged in environmental justice movements and formed coalitions in the past, and current efforts build on those histories. Environmental impacts associated with technological development and deployment are not new, and neither are concerted efforts to stop the destructive forces associated with profit-driven innovation. Today's notion of responsible AI, or socially responsible computing in general, derives from long-standing relationships between the antiwar movement, including the anti-nuclear movement, and environmentalism.¹⁰²

The tensions inherent to reforming technology development through social responsibility have both inspired and plagued STEM students and tech workers for decades. Some radical movements emerged from the late 1960s to early 1970s antiwar movement, like Computer People for Peace, Science for the People, and Computer Professionals for Social Responsibility (CPSR). Historians Megan Finn and Quinn Dupont explicitly tie current tech workers and responsible computing movements to the legacy of CPSR, as the organization was focused on a professionalized form of advocacy based on technical knowledge.¹⁰³

Contemporary tech worker movements around climate action are also connected to older Silicon Valley and transnational coalitions that formed around environmental and racial justice, immigrants' rights, and the labor movement.¹⁰⁴ "Tech worker" and "Silicon Valley" can obscure the gendered, racialized labor that makes tech development happen, conjuring images of geeky male coders. Popular depictions of "tech work" likewise tend to ignore the global supply chains of raw materials, colonialist exploitation, and often risky, embodied labor that have long gone into electronics manufacturing.

Media scholar Lisa Nakamura unearthed Fairchild Semiconductor's manufacturing plant from the 1960s and 1970s, staffed by Navajo women on a reservation, although this story is not recounted in official corporate histories.¹⁰⁵ Stereotypes about women of color and their dexterity in handiwork like weaving translated into their roles in electronics manufacturing.¹⁰⁶ As sociologist Karen Hossfeld found in her study of Silicon Valley workers in the 1980s, women from the Global South were a substantial portion of the workers in the manufacturing sector of tech. Hossfeld also notes how employers stereotyped such workers in gendered and racialized ways, focusing on their small size and supposedly nimble fingers. While women comprised roughly half of the Santa Clara County workforce, they were underrepresented in technician and management positions.¹⁰⁷

These conditions created opportunities for coalition building that came from addressing the environmental impacts of the semiconductor industry, which polluted the water and land around San Jose while threatening its workers with toxic chemicals. Fairchild Semiconductor contaminated the drinking water of South San Jose with a chemical used to remove grease from microchips after manufacturing, which catalyzed community organizing, including the formation of the Silicon Valley Toxics Coalition in the 1980s. The toxic chemicals used in electronics manufacturing caused cancer in immigrant women workers and birth defects in their children. Xiaowei Wang and Ann Chen detail how electronics manufacturing workers in Taiwan and Korea, the new site of electronics manufacturing in the 1990s and 2000s after outsourcing, organized as their colleagues got cancer and other illnesses and died, connecting wastewater pollution to occupational health.¹⁰⁸

To be clear, this type of internal advocacy by tech workers gained significant traction in the five years between 2015 and 2020, before the recent turn to AI ascendance.¹⁰⁹ Indeed, such organizing led to public commitments at companies like Mozilla and Amazon, with many large tech companies such as Google, Microsoft, Intel, Apple, and Meta putting out net zero goals and related climate commitments after the 2015 Paris Agreement.¹¹⁰ Climate action in the tech industry grew in tandem with a more general wave of tech organizing during the first Trump administration in 2017, when tech workers refused to build databases for mass deportation, and workers protested Project Maven, the Pentagon's drone pilot program that employed Google AI, with the hashtag #TechWon'tBuildIt.¹¹¹

Amazon Employees for Climate Justice (AECJ)'s first big action was an open letter to Jeff Bezos and a related shareholder resolution.¹¹² In an open letter published on Medium in April 2019, over 8,700 employees demanded that Amazon adopt the climate plan shareholder resolution and implement a climate plan at the company.¹¹³ Amazon's board voted against the resolution, so Amazon employees organized a walkout of over 3,000 workers in September 2019 as part of the youth-led global climate strike.¹¹⁴ In response, Amazon publicly released its climate pledge, committing to zero emissions by 2040.¹¹⁵

But there is a limit to what companies will tolerate if it threatens their bottom line. While some worker-led climate pushes were successful, those that were more explicitly focused on environmental or economic justice were less so. In 2020, some AECJ organizers were fired for calling out the unsafe working conditions in the company’s warehouses.¹¹⁶

But there is a limit to what companies will tolerate
if it threatens their bottom line.

Michelle Thorne, now the director of strategy at Green Web Foundation, describes the tensions between workplace organizing and corporate-sanctioned sustainability interventions based on her time at Mozilla Foundation, where she was the sustainable internet lead. She saw a contrast between how the corporation side treated climate action, versus the foundation side of the organization. At Mozilla Corp., after employees organized and asked the company to make some kind of climate commitment, Mozilla launched an Environmental Champions cohort in 2020, which relied on the volunteer time of 14 individuals.¹¹⁷ The language in their launch post, on incorporating climate science into everyday work at Mozilla and noting the hours of volunteer time each “champion” would dedicate “to set positive examples and highlight sustainability as a catalyst of innovation” very much echoes the focus on volunteerism and innovation discussed in the previous section. After an internal campaign on the part of employees, Mozilla released its climate pledge in January 2021, which was largely focused on carbon offsets and RECs.¹¹⁸ While employees across the corporation and foundation strove to work together on sustainability issues in a more holistic way, even bottom-up, grassroots sustainability efforts within tech companies can be integrated into existing business priorities, enacting a form of environmental justice capture.

Sustainability efforts at the foundation included public education efforts like the creation of a glossary, art exhibits, a speaker series, and interdisciplinary workshops.¹¹⁹ Michelle was also successful in enlisting the Mozilla Foundation to drop cryptocurrency donations because of their resource intensity.¹²⁰ At the Mozilla Foundation, she and fellow workers were able to apply an organizing mindset in their outreach to philanthropic funders. This led to the formation of the Green Screen Coalition, which bridges digital rights and climate justice through research.¹²¹ Michelle used her position at Mozilla Foundation to create *Branch Magazine*, along with Chris Adams at Green Web Foundation, and then formally joined the Green Web Foundation to fund a set of fellows that incorporated climate justice principles into tech worker organizing approaches.¹²²

Organizing Post-Net Zero

In a time of AI ascendance and climate hostility, tech workers, former tech workers, and advocacy groups are working together to fight back against tech’s growing environmental footprint. While workers might push for internal changes at a company, sometimes they agitate more publicly, putting pressure on their employer, while also forming coalitions with organizations outside of tech. Climate-conscious tech workers have much to learn from other environmental justice organizers who have been in the fight for longer.

Eliza noted the strong synergy between Amazon’s warehouses and their data centers, highlighting that frontline communities have been protesting the environmental impacts of Amazon’s warehouses and that Amazon is “using the same playbook” for their data center expansion by hiding behind shell organizations, getting tax breaks from municipalities, promising economic benefits that don’t pan out, and buying off local officials.¹²³ And as Eliza also noted, environmental justice groups have successfully pushed back against Amazon’s warehouse expansion projects: “Groups like People’s Collective for Environmental Justice have won warehouse fights and warehouse moratoriums in municipalities, as well as statewide warehouse emission regulation (the Indirect Sources Rule, which is now being replicated in New York and New Jersey). The Moving Forward Network also includes EJ (environmental justice) groups that have been fighting warehouse expansion.”

In the face of growing corporate indifference to climate pledges and environmental deregulation in the US, Amazon employees have continued to organize. In 2024, they released an “Unsustainable” report in a wry response to the company’s misleading sustainability report. (Their “executive” summary is in scare quotes, and its subtitle is “Or, the summary the executives aren’t giving you.”)¹²⁴ AECJ claims that Amazon obscures its true carbon footprint by not accounting for the full life cycle of the products it sells. While Amazon claims to be making progress toward its emissions goals, the expansion of AWS data centers is increasing demand for fossil fuels, and the company is selling its products to fossil fuel companies. The authors of the report strategically use quantitative data to support their claims, pointing out that Amazon emits as much carbon as a country and calculating the emissions that are left out of the company’s reporting. They also provide a primer on RECs and carbon offsets, and highlight the importance of time and place in thinking about energy costs, e.g., “In 2022, 15 of 29 operating AWS regions (52 percent) likely did not have any AWS renewable energy projects in the same regional grid.” AECJ’s counter report calls out the ways that the lab mindset can be used to manipulate the public through misleading statistics.



[Burns Trust report cover](#) by Amazon Employees for Climate Justice.

This form of counter narrative is a central part of the organizer mindset, which provides more holistic assessments of environmental and social harms. “Unsustainable” also calls attention to EJ and labor issues, playing on the format of annual corporate ESG and sustainability reports to show how carbon accounting practices and emissions associated with a company’s operations do not capture the full spectrum of issues attached to the company’s footprint. The report points out the company’s role in environmental racism, as the company places their warehouses disproportionately in communities of color and subjects them to pollution, and the labor impacts of climate change on delivery and warehouse workers, who are falling ill and sometimes dying from heat stress while on the job as temperatures climb.¹²⁵ In a moment when Amazon’s CEO is stating that many of its white collar workers might be replaced by AI and coders are claiming that their workflows are beginning to resemble warehouse workers, there is perhaps more room for solidarity across the Amazon supply chain,

between workers in different parts of the vast company’s global reach.¹²⁶ The authors also describe the limits of carbon intensity as the only metric for sustainability, as green extractivism means that the mining of lithium and cobalt is also supporting child labor and environmental destruction in the Global South.¹²⁷

Kairos Fellowship released a similar response to Google’s 2025 sustainability report, calling into question the company’s emissions reporting that relied on market-based emissions rather than location-based emissions. Kairos also pointed to Google’s role in climate disinformation and the environmental impacts of their technologies being used in military campaigns.¹²⁸ *The Guardian* published an exclusive on the report, helping the organization’s findings reach a wider audience.¹²⁹ Insider knowledge and technical expertise help shape the counternarrative, providing *viable counterdata* and arguments for other activist groups and the press to take up.

Climate-conscious tech workers highlight the problems with selective disclosure, whereby tech companies capitalize on calls for transparency by releasing deceptive metrics.¹³⁰ In order to fight the misleading narratives and dubious numbers published by tech companies, some organizers use their positions as technical experts to push back. Masheika Allgood was a responsible AI expert at Nvidia who quit her job in protest when she discovered the true water costs of AI; she subsequently developed a water calculator to more effectively measure AI’s water use.¹³¹ As she describes in an interview with the Green IO podcast, she has a personal stake in her fight against AI and its related environmental costs: from her home in San Jose, she can hear the sound of data centers’ backup generators, which keep her up at night. She also worries about the pollution that data centers bring to an area that is already experiencing poor air quality, and the use of water in a region that is often experiencing drought.¹³² Under pressure from experts like Masheika and the general public, who have pushed for more transparency around the company’s environmental impacts, Google issued more specific reports on the energy and water costs of Gemini’s inference.¹³³ When Google released their report on measuring the environmental costs of AI, Masheika published a counter report calling attention to their misuse of numbers.¹³⁴ Google focuses on individual queries rather than the entire impacts of the AI system and its supply chains in a form of misleading, selective disclosure. Using the organizer mindset, climate-conscious tech workers call for more holistic forms of measurement in the reporting of companies’ environmental impacts.

Other climate-conscious tech workers discussed their role as researchers in supporting grassroots efforts. After leaving DeepMind, Boxi Wu’s research at the Oxford Internet Institute focused on the local politics of data center development in the United Kingdom. Boxi described how a member of the Havering branch of Friends of the Earth, a long-standing environmental group founded in 1971, built power with other EJ groups and communities near a planned data center on the outskirts of East London, marketed as “Europe’s Largest Data Centre Campus.” As Boxi put it,

Talking through this wider movement around data centers and the environmental impacts of AI fired him up to get in contact with two friends from related local environmental organizations, and then within a week or two, they’d linked up with a local residents group and formed a group of 30 to 40 people to contest the planned data center.

While enlisting sizable groups of people to show up to town halls and local development meetings or community consultations is part of the battle, successfully organizing around data centers requires data collection and a certain degree of knowledge about how environmental impact assessments work, as well as familiarity with the local political landscape. A lot of the East London organizing was focused around community consultations, understanding environmental assessments, understanding which local councils they could get in contact with, and then figuring out what the process for community consultation is. This is why hyperlocal knowledge and

coalitions are needed in each case, even if sharing general information, databases, policies, and how-tos across regions where data centers are planned can be valuable.

Some of Boxi's comments about their ambivalence around traditional academic or scientific research mirrored conversations I had with practitioners in the tech industry who questioned the efficacy of their internal sustainability goals:

In order to support data center activism, I'm tempted to do this separately from my PhD project and just pursue it in a way where I don't have to worry about citations and academic research, and I can think more with communities on the ground about what they need. For example, the Havering community group really needed data on the local impacts of data centers to support their contestation of developer and local council claims about the development's so-called local economic and sustainability benefits.

In attempts to find this data, I only came across the work of Good Jobs First, which was one of the few reports I found that wasn't written by or with the data center industry!

The nonprofit organization Good Jobs First has a subsidy tracker that examines the tax breaks that data center operators are getting in each state; the organization also produced a report looking at the economic impacts of data centers across the United States.¹³⁵ Good Jobs First is a small organization, and there is a need for more of this kind of research to counter industry talking points. Tech practitioners and academic researchers alike can contribute their expertise and time to nonprofit organizations that are mapping the data center landscape, especially when many small nonprofits are underfunded and understaffed.

Climate-conscious tech workers sometimes organize with broader groups and help bring media attention to environmental issues. Eliza shifted jobs internally at Amazon several times in order to find places to make more of a positive impact, and built on connections she had made with grassroots EJ groups where she lived in Seattle.

After doing that [sustainability] work for a year and a half or two years, I felt like it wasn't moving the needle. In parallel, I was volunteering with a climate organization in Seattle that had nothing to do with tech. We were focused on direct action around fossil fuel infrastructure and clean energy policy in Washington State. Through that work at 350 Seattle, I met other people who worked at Amazon who also cared about the climate crisis.¹³⁶

Eliza argues that there is power in tech workers organizing because it tends to get media attention, so white collar tech workers can use their privilege to support activists. AECJ reached out to environmental groups about Amazon fighting a clean energy bill in Oregon. The group had been trying to get attention from the press beyond the local level:

There's not a lot of attention that's paid to the important work that environmental orgs are doing, but when we got involved, the story then became tech workers speaking out against their boss, which appears to be a more interesting story

from a media standpoint. Then we were able to get more exposure on what was happening in Oregon.

Similarly, Holly and Will Alpine launched the Enabled Emissions Campaign after leaving their jobs at Microsoft, pushing for recognition of how companies like Microsoft sell their AI products to fossil fuel companies. In many cases, activists are using their technical skills and credibility to advocate for broader change. Drew Wilkinson, who cofounded the climate community at Microsoft alongside Holly, continued to advocate for bottom-up approaches to sustainability after he was laid off from his job in 2023. In an interview with WorkforClimate, he said, “we help create a movement of climate literate and articulate people in every company, who will have enough knowledge and courage to discern the difference between greenwashing and real action, and then be able to actually hold their employer responsible for that.”¹³⁷

Tech worker whistleblower stories are also likely to attract media attention. Holly’s decision to quit Microsoft was detailed by investigative journalist Karen Hao in *The Atlantic*, which helped Holly and Will attract invitations to be on podcasts to further spread their message, like the two-part series on Green IO.¹³⁸ Holly’s story was featured in *Grist* and Drew’s story, including his punk rock origins, was written up by *Fast Company*.¹³⁹

Tech worker whistleblower stories are also likely to attract media attention.

Climate can also be a difficult issue to form long-term advocacy around because climate change does not have a singular focus or timeline, unlike acute anti-military campaigns or labor-related organizing struggles that might be more time-based, e.g., supporting a union’s contract or organizing against a particularly bad piece of legislation like Proposition 22 in California.¹⁴⁰ One interview subject mentioned how many people at a large company organized a rally and internal pressure to stop a military contract from going forward. This was a singular issue and people organized around it, “whereas it’s harder to push back against generative AI’s use in the workplace because of climate cost. The temporality of climate change makes it harder. And in a way that I see the climate thing is just more diffuse, there needs to be some moment. And I don’t think we have a moment.”

Boxi Wu found that internal organizing for climate and for racial justice at Google DeepMind, whether through formal RAI positions or in volunteer-led employee groups, became harder to sustain in the face of organizational changes and AI hype:

I definitely turned to local, community organizing after (leaving GDM), because I could see the limits of change from within. For example, myself and others tried so hard during COVID to set up the POC [person of color] ERG and other similar initiatives, but many of these efforts have been organizationally deprioritized over the years. Ethics teams will often campaign for certain topics to leadership, but it became super clear that none of these things are a priority once the industry pivoted to the LLM-type race.

After leaving Google DeepMind, Boxi became involved in EJ groups led by diaspora communities: “Some friends and I came together to try and organize around East and Southeast Asian (ESEA) climate justice issues. And part of that is because the climate impacts of military technologies that are exported, or mining or just climate change in general, play out in our home countries, and so there’s this element of diasporic connection with those issues.” They also noted the connections between climate justice organizing and anti-military campaigns, using tactics from other social movements, including zines for political education purposes.

Boxi argued that it seemed more effective to push for change externally rather than from the inside, because after leaving a company there is less fear of retaliation for standing up for political causes: “I actually think some people have been engaging more with No Tech For Apartheid once they’re out, because there’s no longer the risk of being fired or losing your visa if you share information.”¹⁴¹ They argued that while institutional change can feel incremental and often tokenistic, coalition building outside of tech can be more aligned with the reality of social and environmental issues without fear of retribution. In their experience, company-sanctioned internal interventions focus more on technical interventions like data or model efficiency rather than shifting resources to effect meaningful change. One strategy offered by other climate-conscious tech workers was to ensure that there is mass collective action around controversial issues, so that individual employees are less at risk. While people often say they will organize once they leave a job, much like academics who argue that they will be more politically active post-tenure, this is not always the case.

But even for practitioners who aren’t part of activist movements, local grassroots organizing and reporting can reach them and impact their views of their own positions with tech companies. One senior engineer, Satya, described her awareness of local fights over a Google data center’s use of water:

I live in Oregon. Even before I was on the data center product team, I had been reading local stories of what’s happening with the data centers and the Columbia River, and the conflicts with the local people who wanted transparency on why their water and power bills were rising. But this was a major shift that happened because of an Oregonian story on the Dalles data center that led to Google starting to report on their water usage. So you see, once there is public, nonprofit involvement on a topic of interest to a community, it can lead to a change, right? Is it all the change needed? No, it wasn’t. But, you know, it was a start.”¹⁴²

Satya pointed to the role of local environmental commissions and local and state agencies in pushing for more transparency, especially amid the rapid growth of the data center industry in states like Oregon. In Oregon, grassroots efforts by groups like Oregon Citizens’ Utility Board, a nonprofit founded in 1984 to advocate for citizens’ utility interests, have led to public education campaigns and even a successful bill that protects ratepayers from absorbing the energy costs of semiconductor factories and hyperscaler data centers.¹⁴³ Companies have the resources to lessen their negative environmental and social impacts on communities, and it takes grassroots coalitions and regulation to push them to effectively measure and mitigate those impacts.

Educating fellow tech workers, especially around the tech industry’s impacts across the larger AI supply chain, is another strategy that climate-conscious tech workers employ. A mechanical engineer who has worked at large tech companies started Chip Workers 4 Responsible Mining to call attention to the environmental destruction and human rights violations that produce the

materials needed for chips.¹⁴⁴ Chip Workers 4 Responsible Mining educates tech workers on the semiconductor industry's role in perpetuating human rights abuses through cobalt mining operations in the Democratic Republic of Congo, enlisting support from workers at Apple and Intel. There are due diligence directives within CSR and ESG practices, and the Securities and Exchange Commission (SEC) demands that companies disclose any use of conflict minerals.

How do we think about the human and environmental costs across the supply chain rather than limiting ourselves to only thinking about energy, water, and carbon costs during manufacturing and training

One tech worker activist I spoke to mentioned that she was concerned that many policymakers took for granted that the problem of conflict minerals had been solved through regulation. Corporate sustainability reports do not tell the whole geopolitical story. She was adamant that thinking about critical minerals and the larger environmental impacts of AI should be part of “responsible AI” but that is rarely the case:

So what I'm hoping to do through Chip Workers 4 Responsible Mining is to activate workers in the semiconductor and tech industry to approach their companies about their policies, their supply chain, in a way that can affect change. Most hardware companies have some sort of ESG approach, which involves a due diligence standard. There's a bunch of principles that they're supposed to follow, but it usually includes some sort of auditing program and tracing program and a grievance mechanism. And that last one is important. Every company has some sort of public grievance mechanism where you can submit a report or some sort of issue that they're supposed to follow up on.

With this recommendation, she offers a strategy that tech workers can use while they are still in positions of influence within companies, potentially using a mass grievance campaign as part of workplace organizing.

Tech worker activists and those in adjacent organizing circles ask how we both can conceptualize and organize against the harms that AI enacts — in terms of policing, surveillance, immigration detention, labor abuses, and war — and its environmental impacts related to infrastructure? What is a data center being used for, and who does it benefit? Does it help oil and gas companies extract fossil fuels while the operation of data centers also keeps us from transitioning away from fossil fuels? How do we think about the human and environmental costs across the supply chain rather than limiting ourselves to only thinking about energy, water, and carbon costs during manufacturing and training? In the next section, drawing on some of the interdisciplinary gatherings I have convened or participated in, practitioners describe their work around data center policy and resistance, combining the need for streamlined data gathering and metrics with political

education and organizing. New forms of data, coupled with collective action, are needed to counter the metrics-based false claims of tech companies, who are capitalizing on the current political climate and AI ascendance to grow their power.

Part IV: Data Centers: Community Responses to Speculative Energy Futures

With an understanding of both the lab and organizer mindset, we can now return to the opening claims of this report; we are in a moment of both AI ascendance and data center accelerationism. For climate-conscious tech workers who have embraced the organizer mindset, it is clear that addressing data center construction and expansion is critical. And countless organizations are working to counter this expansion through the forms of public advocacy described in the last section. But careful attention to these efforts reveals that one of the primary challenges to this work is creating what I call viable counterdata. That is, in order to be successful at limiting or reversing the harms of data center expansion, climate advocates need to be able to produce and leverage data that is considered viable by those in positions of power.

the lab and organizer mindsets can be recombined to create viable counterdata, forms of data that communities can use to push back against data center encroachment.

More cross-sector, interdisciplinary work on data centers is needed in this critical moment. With data center operators withholding key information from the public, there is a need for greater transparency and accountability. In some cases, communities do not even know which companies are building data centers in their neighborhoods and have very little information about their energy and water requirements or their potential health impacts.¹⁴⁵ Promises about economic development and financial gains for municipalities, states, or countries may not bear out in reality.¹⁴⁶ Much like tech workers who sign NDAs (non-disclosure agreements) with companies they work for, public officials who form agreements with data center operators also sign NDAs, limiting the information they can release to the public.¹⁴⁷ For example, in Bessemer, Alabama, the mayor signed an NDA that prevents him and other city officials from discussing the potential environmental and health impacts of a massive data center there.¹⁴⁸

Fights around data centers are instructive case studies for seeing how calls for more transparency and better, more granular reporting on the environmental impacts of AI can intersect with

grassroots social movements. In this way, the lab and organizer mindsets can be recombined to create *viable counterdata*, forms of data that communities can use to push back against data center encroachment. Communities have gathered their own data on EJ issues around petrochemical plants, mining operations, and other forms of industrial pollution to hold companies accountable.¹⁴⁹ Some practitioners from the tech industry have taken their insider knowledge and used it to work with broader EJ coalitions. With the understanding that both technologists and academic researchers who work with communities might have their own agendas and engage in extractive practices, I next detail some examples of the ways that the general problem of information asymmetry in data center accountability can be mitigated through collaborative data collection efforts.

Viable Counterdata: Assembling Evidence of Data Center Impacts

Unmitigated data center expansion has led to community resistance around the globe, especially as certain regions have become data center hubs, such as Loudoun County, Virginia, dubbed “Data Center Alley,” which is considered to be the world’s data center capital.¹⁵⁰ Community resistance to data centers has led to slowdowns or even temporary moratoriums in some locations, including in the Netherlands, Ireland, the UK, Chile, and Spain, as well as in Indiana, where as few as 40 people showing up to a developer meeting can slow down data center plans.¹⁵¹ Different researchers and grassroots organizations have produced guides to help communities and advocates understand the full spectrum of social and environmental issues connected to data centers and how to take steps to fight back against data center-related harms. STS scholar Anne Pasek produced a zine about organizing against data centers, providing instructions for connecting IP addresses to physical data center locations.¹⁵² Kairos Foundation and MediaJustice produced a visually striking organizer guide, while *The Maybe* published a report highlighting data center impacts and community resistance in several field sites around the world, including in Chile, the US, the Netherlands, Mexico, and South Africa.¹⁵³ Zines and public-facing materials published by researchers and activists combine the theoretical, historically-oriented work of critical data center studies with pragmatic steps that individuals and groups may take.¹⁵⁴ Such resources are critical at a time when communities all over the world are facing data center encroachment and require sufficient information to effectively strategize and negotiate.

In our conversations, practitioners and advocates alike spoke about the need for more robust and systematic forms of data collection and comparisons across sites and sharing across domains. They referred to the problem of gathering data. Community-gathered data around EJ concerns is not always legally actionable, and it can be difficult to collect data about health and life quality issues that are harder to quantify.¹⁵⁵ One technologist was able to track methane leaks using an AI tool, but then started knocking on residents’ doors and learned about various health and economic impacts, ranging from rank smells that displaced people from their homes and farms to the pollution-related deaths of livestock and even miscarriages. Quantitative assessments fail to capture the full spectrum of harms attached to tech’s growing footprint. Companies can obscure their environmental impacts through selective disclosure, but how can communities measure the impact of a miscarriage? While some practitioners have started devising frameworks for quantifying the public health impacts from data centers, these are preliminary; speculations about the potential health impacts related to backup diesel generators (for instance) don’t necessarily capture the human stories behind the data, or the real harm that generators can do.¹⁵⁶

Organizations use various methods to access accurate data about climate impacts. Some organizations rely on the Freedom of Information Act (FOIA) to request government documents, have the resources to sue for information, or have the technical capacity to aggregate and analyze disparate data streams. Journalists, lawyers, NGOs, and data scientists may all take different methodological approaches to this work.

Quantitative assessments fail to capture the full spectrum of harms attached to tech’s growing footprint.

Business Insider published a series on calculating the environmental impacts of data centers, using mapping location information from data center permits onto the Aqueduct Water Risk Atlas, and “found that 40% of data centers were sited in areas of high or extremely high water stress.”¹⁵⁷ Most grassroots organizations do not have the legal backing or resources to sue for information or to withstand lawsuits: *Business Insider* was sued by utility agencies in Colorado to prevent them from gaining access to water use records, an expense which could be devastating to underresourced groups. Many community advocates wanted better data on permitting and siting because that information is often hidden from the public. Tech companies hide behind shell companies and ask local officials to sign NDAs, so communities are often only aware of data centers after construction has started and when it is too late to oppose them or find opportunities for negotiation.

Communities also need a way to track the promises made by data center operators and the long-term viability of data center buildouts. What is often missing from a cost-benefit analysis is what happens when data center contracts are paused or disappear. What if companies, utilities, and governments overbuild?¹⁵⁸ As Naomi described:

When the AI boom hit Malaysia, the government signed many data center contracts. But DeepSeek changed that, since it demonstrated that this amount of energy buildout wasn’t necessary to AI development, and the stock market crashed. People panicked because they had expected years of financial gain from these data center investments.¹⁵⁹

Similarly, after DeepSeek, some tech industry insiders began to question the need for data center buildout. Some tech companies, including Microsoft, have paused or canceled hyperscaler contracts in states like Wisconsin and Ohio.¹⁶⁰ These paused or canceled contracts are a result of inaccurate energy demand forecasting, which means that the infrastructure may not ultimately be useful or used effectively. One advocate pointed to the ways that these canceled leases might negatively affect communities, asking what happens when permitted projects have disruptions that lead to the use of more diesel generators or other harmful stopgap measures.

Building Coalitions and Sharing Knowledge

Political education and coalition building are both essential when it comes to local and state level data center fights. One model involves data scientists working with state or local governments and communities to assess the water use or energy use of data centers. For example, policy fellows at the Aspen Institute used FOIA to gather information about water use in Utah data centers. Technologists Jonathan Gilmour, Rebecca Kilberg, and Mary Clare Bosco published a policy memo and a related op-ed based on their work with Salt Lake City, and provided their expertise pro bono during their fellowship.¹⁶¹

Eliza Pan and other organizers at AECJ also formed coalitions with other local stakeholders. In 2023, a journalist for *The Oregonian* wrote about a proposed bill in the Oregon state legislature. The bill would have required all data centers to be held to the same renewable energy standards as public utilities. Amazon opposed the legislation because they were planning three new data centers in Oregon and successfully killed the bill:

We were pissed off. We sent out news to thousands of our supporters at Amazon and got a member to testify in support of the legislation. We got national press coverage on Amazon's role in killing clean energy legislation. We found it too late. We were two months away from the vote. The lead sponsor said that it was Amazon that killed the bill.¹⁶²

This coordinated effort yielded some successes. Because of AECJ's work in helping to spread the news in Seattle, a local direct action group temporarily blocked the entrance to the office building where Andy Jassy, the president and CEO of Amazon, works, leading to local news coverage. According to Eliza, "After that action, Amazon announced that they were no longer planning to power their new data centers in Oregon using gas, though they didn't say what the alternative was going to be. So Amazon killed the bill but we were able to get Amazon to go back on its plans to power the new Oregon data centers with gas." While their organizing efforts did not stop data center construction altogether, they were able to push Amazon into abandoning their destructive plan to use gas to power their new data centers.

After the COVID-19 pandemic, webinars have also become a mechanism for sharing knowledge and political education, such as MediaJustice's Spring 2025 series "WFT: the Rise of the Tech Broligarchy," which included a webinar about data centers, and webinars targeting specific audiences, including one in January 2025 hosted by Citizens Action Coalition, "The Hidden Costs of Data Centers," specifically targeting communities in Indiana.¹⁶³

On April 18, 2025, I hosted a webinar along with members of the Tech Workers Coalition as part of SF Climate Week.¹⁶⁴ The speakers from different organizations situated AI firmly in the local, social and environmental impacts of data centers. As organizers, we wanted to help bring awareness of these EJ and labor rights concerns to rank-and-file tech workers, who may be worried about the carbon, water, and energy costs of LLMs but not be aware of how or where they could potentially intervene. Such interventions can help connect the economic and environmental implications of data centers to social justice issues, including what data centers are actually used for in terms of mass incarceration, surveillance, policing, ICE and immigration detention, and war. Data centers

are burdening communities that may not even have access to digital infrastructure and bandwidth themselves, and data centers are tied to larger mechanisms of data violence.

Some advocacy organizations have also created community toolkits that provide methods for collecting viable counterdata. Toolkits can target specific audiences in particular geographic contexts or can offer more general guidance. MediaJustice produced a toolkit to accompany their report on environmental racism and data center organizing in the American South.¹⁶⁵ The Sierra Club's Georgia chapter released a toolkit for data center construction in the state, including talking points and guidance for public meetings.¹⁶⁶ Masheika Allgood produced a toolkit to help communities know what questions to ask officials when data centers are planned in their cities, while also launching the toolkit in a webinar on LinkedIn.¹⁶⁷

In the current landscape in the US, where renewable energy is at the center of political fights and has the ability to create strange alliances across party lines, coalitional interventions are even more crucial. In June 2025, the Sierra Club, AECJ, Public Citizen, and the League of Conservation Voters published an open letter to the CEOs of Amazon, Google, Meta, and Microsoft in both *The San Francisco Chronicle* and *The Seattle Times* demanding accountability: "We call on you to follow your climate goals by publicly calling on utilities to commit to no new gas and zero delayed coal plant retirements to power your data centers. As the largest customers on the grid, tell utilities you need an affordable and reliable decarbonized grid that benefits all customers."

Part V: Recommendations: The Future of Sustainability in Tech

As greenwashing tactics from the height of the net zero era fall away and even vanilla forms of ESG compliance are politicized, one potential opportunity is that climate-conscious tech workers are free to reimagine what meaningful climate action looks like. Where the lab mindset has failed, the organizer mindset might step in. Following these recommendations circumvent the regulatory capture of the lab mindset and its measurement-focused traps. In the current political context, with corporate and government investments in expanding energy infrastructures to support AI, and in a labor context in which even white collar tech workers are at risk of losing their jobs to AI-related layoffs, what steps can tech workers, advocates, and policymakers take? What kinds of coalitions are needed at this moment? How can we seed transnational conversations that address the full supply chain?¹⁶⁸ What are the most effective ways of combining internal and external pressure?

one potential opportunity is that climate-conscious tech workers are free to reimagine what meaningful climate action looks like.

Climate-conscious tech workers can take insider knowledge from within companies and translate it to communities, using their expertise to gather viable counterdata. There is a dire need for standardized measurement practices, transparency, and mandatory reporting when it comes to the environmental impacts of AI and computing as a whole. But, given tech companies' tendency to obfuscate through selective disclosure, there is also a need to combine legally and politically actionable quantitative metrics with qualitative data on embodied effects on communities and environments that are outside the scope of emissions, water use, or energy consumption data. Gwen Ottinger describes the process of including Bay Area residents' concerns about air quality near oil refineries as one of "responsible epistemic innovation," where responsible innovation researchers strategized to find ways of quantifying embodied community experiences through the creation of the Toxic Soup Index.¹⁶⁹ Bodies of evidence must be built from the ground up.

The narratives and development-related promises attached to AI data centers often rely on misleading economic stimulation, like jobs and tax revenue, to justify their use of resources. This is especially true in places where there is already a long history of environmental racism and economic inequality. While policy recommendations and organizing strategies around data centers must be hyperlocal and rely on situated research, this work is necessarily regional and global; if one

state has a data center moratorium, the burden will necessarily shift elsewhere, leading to a kind of data center whack-a-mole.

It is also important to highlight that mitigation efforts that work in one location will not always work in another. Every municipality, let alone country or region, has unique regulatory, cultural, geological, and political features that will inform organizing efforts. This is why it's crucial to compare notes and share strategies with researchers and activists on the ground around the world. While much discussion centers on the complexities of renewable energy and environmental trade-offs, Black and Indigenous communities disproportionately experience the harms of extraction, infrastructure expansion, and waste disposal, along with related systems of incarceration and surveillance. Data centers are not just a physical manifestation of the material underpinnings of the cloud, but are connected to much larger systems of state violence and labor abuses. So-called energy abundance or dominance relies on a complex supply chain, including mining critical minerals for chips, intensified manufacturing processes, and growing e-waste.

Many climate-conscious tech workers I interviewed discussed the need for more community engagement around AI's environmental impacts, and the creation of community benefits agreements (CBAs), which are legally enforceable contracts signed by project developers and community groups or government officials to ensure that communities have some say in a project.¹⁷⁰ This with the caveat that public participation can't solve everything, particularly when there is a great power imbalance. Stakeholder engagement is difficult, and takes time and money that companies are rarely willing to spend. A model of community engagement where companies pull in marginalized communities to help them evaluate their AI systems for potential harms is not necessarily going to benefit those communities.¹⁷¹ And that's why starting earlier in the process is important, before data center permitting and construction or AI development has started. There has to be a consideration of the full range of public health impacts and economic impacts in addition to a standard environmental impact assessment. If a company is using agricultural land for a data center or putting a transmission line through a public park, or if tax breaks to hyperscalers are taking revenue away from local schools, the people bearing the brunt of these decisions need to be notified up front of the potential costs. Communities also need to have input on how these processes unfold, especially when as it currently stands, they bear all the costs and reaping none of the benefits. Grassroots groups are already thinking about these issues and have their own expertise; why aren't they being brought into the decision-making process?

What Can Climate Action in and Against Tech Look Like Now?

Combine internal pressure with coalition building.

- Worker-led activism around climate change has led to some internal wins, including corporate climate pledges and net zero goals. But such efforts are limited given that employees do not ultimately hold decision-making power. Tech workers have also achieved positive outcomes when they agitate for systemic change with broader coalitions outside of tech. Internal practices of compliance and discourses around innovation can help support some climate advocacy, but workplace organizing campaigns and external pressure, including attention from the public and the press, is also advantageous.

- There is a need for more dialog between data center workers and other kinds of tech workers at other parts of the tech supply chain. Data center workers are often subcontractors and have occupational health concerns that can connect their interests to other subcontracted workers in tech companies.

Gather qualitative and quantitative data.

- Technologists work to quantify the environmental impacts of AI across the development life cycle and supply chain, and companies must be more transparent about their energy use, emissions, and water use metrics. But communities also experience impacts that are less technically salient, or that are more difficult to measure in a systematic way. This includes the need for more broad-based quantitative analyses of the impacts of subsidies, land use, and pollution, as well as more attention to individual stories of hardship.
- Gathering this data requires public participation; community members should be included in the decision-making process when data centers and related AI energy infrastructures are permitted and planned, and their accounts should be included in any assessment of the social and environmental impacts of AI systems.

Lend expertise to existing grassroots movements.

- Small organizations are often understaffed and underfunded. Tech workers with expertise in data science and empirical data collection, or who have insider knowledge, can bring those forms of expertise to community organizations and bolster their efforts. There is a need to compare data across sites and regions. In the US, the Athena Coalition has started an onboarding process for organizations that are new to data center fights, and this kind of work is necessary as data center expansion becomes more widespread across the US and the world.

Seed regional and transnational comparisons.

- There is an opportunity for advocates who are organizing around data centers in one location to look at policy successes and failures in different regions to assess potential points of intervention. While environmental impacts are geographically situated, there is a need for more systematic mapping and tracking of environmental harms attached to AI and various tactics that have been attempted. Comparisons across sites are vital because what is effective in Indiana and Virginia might not work in California or Chile.
- We need to collect more forms of data on policy developments in different parts of the world and have a repository for advocates. We also need more interdisciplinary spaces for closed-door conversations.

Document and address the larger supply chain.

- It is important for advocates to consider the larger labor supply chain and to think about how the minerals and raw materials used to produce GPUs are part of a larger system of exploitation and environmental degradation. This is the lesson from the limits of green capitalism and investments in lithium batteries. Data center fights can also learn from other sites of resistance around critical minerals, mining, fossil fuel extraction, and electronics manufacturing.

Acknowledge histories of environmental racism and economic inequality.

- The tech industry is always looking forward, focused on the next financial quarter and on speculative futures, but the current fights over AI's environmental impacts are connected to situated histories of racism and development.
- Too often, it can feel like every organizing campaign is reinventing the wheel, but there are many historical precedents for our current moment of AI ascendance and data center accelerationism. AI researchers and tech activists should be in conversation with EJ groups and labor historians.

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Appendix

This report is based on qualitative, semi-structured interviews with 35 practitioners in the technology industry who are engaged in work related to environmental sustainability and advocates who are attempting to mitigate the environmental impacts of computing. Interviews were conducted between July 2024 and May 2025. Interviewees reflect a range of backgrounds, including green software technologists, UX researchers and designers, corporate responsibility staff and consultants who engage with corporate responsibility teams, and venture capitalists focused on Environmental, Social, and Governance (ESG) investments. I interviewed people involved with informal and formal kinds of organizing around environmental and climate justice, including workers at a range of companies, from tiny startups to major corporations. Interview subjects are based in a range of countries in North America, Europe, and the UK.

Many of my interview subjects are also collaborators and people with whom I have been in conversation for years, so some of my observations and framings are based on these informal, intermittent discussions. For example, I finally met Holly and Will in person at a wine bar in Oakland after many months of video meetings and email threads. Likewise, my interviews and analysis are informed by my own experience working on a green software product as a researcher and strategist at Intel from 2021 to 2023 and as part of Green Software Foundation's policy working group during that same time. I have ample experience working on sustainability in industry and policy contexts, and my questions for my interlocutors reflect my time in analogous positions. This report builds on some of my previous work.¹⁷²

This work is also informed by participatory workshops and convenings of tech workers, researchers, and grassroots activists, including a webinar I co-hosted with the Tech Workers Coalition on April 18, 2025 and an in-person event we held in Oakland, California on April 26, 2025. At the April 18 webinar, speakers included Katherine Jin from NYC DSA Tech Action, who described their policy-oriented organizing work against data centers in New York State. Savannah Wilson from Clean Virginia spoke about policy related to data centers and utilities companies in Virginia, highlighting attempts at responsible data center reform through policy interventions. We also included speakers who consider the applications of AI and broader supply chain issues, with former Microsoft workers Will and Holly Alpine from Enabled Emissions Campaign talking about AI's role in fossil fuel extraction, Danny Cendejas from MediaJustice focusing on data centers' relationship to surveillance and policing, a representative from Chip Workers for Responsible Mining calling for more tech worker advocacy around critical mineral extraction and human rights issues surrounding AI hardware. Eliza Pan from AECJ discussed how tech workers can change the narrative around responsible AI and data center development. Speakers discussed a variety of tactics, including internal pressure campaigns and coalition building with journalists and community organizations to fight for policy changes, while also pointing to the various environmental and social impacts of AI infrastructures across the entire supply chain, showing how even local issues around data centers are also connected to matters of political economy.

In addition to these formal and informal exchanges, I also draw on my experiences as a member of the Athena Coalition’s data center working group meetings, a clean energy conference hosted at the Berkeley Energy and Resources Collaborative, and my participation in the Federation of American Scientists AixEnergy Policy Sprint, as well as my long-term participation in the Tech Workers Coalition and the Climate Action Tech Slack community. Throughout my interviews, the same groups and organizations were mentioned by my interlocutors again and again. Tech workers were following each other’s work. It’s a small world where an individual or a small organization can have a major impact.

For this reason, I have taken great care to anonymize the identities of workers who are still inside companies, especially in a moment where any kind of activism or public complaint can be grounds for dismissal. In these cases, I use pseudonyms and in rare cases, create composite figures to further protect people’s identities. I mention other sources by their real names, especially for figures who have left their positions in tech and deserve recognition for their academic publications or other public-facing work.

Endnotes

- 1 Cofounders Drew Wilkinson and Holly Alpine no longer work at Microsoft. Drew has since become a mentor for tech workers who want to incorporate climate into their jobs. Microsoft still features them both on the company’s website, with a photo of them riding their bikes in the streets of Seattle, touting the climate-oriented employee network they created. “We don’t give up easily. ‘No’ doesn’t intimidate us,” Microsoft, accessed August 20, 2025, <https://news.microsoft.com/life/worldwide-sustainability-community/>
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- 7 This is especially true now that the Trump administration is actively undermining the growth of renewable energy infrastructure in the US, but critics have long observed that renewable energy doesn’t support

- infinite growth, and that rapid decarbonization is difficult in the face of the powerful fossil fuel lobby. See Trevor Jackson, “How to Blow Up a Planet,” *New York Review of Books*, September 25, 2025, https://www.nybooks.com/articles/2025/09/25/how-to-blow-up-a-planet-abundance-klein-thompson/?lp_txn_id=1639147.
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