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## IV. Predatory Delay and Other Myths of “Sustainable AI”

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We are living in an ecological crisis. Devastating heat waves, storms, and fires remind us of how human activity impacts the planet and all life on it. Policymakers and industrial leaders are banking on future promises of technology to save us—while delaying critical action on proven climate solutions.<sup>83</sup>

AI for sustainability is the latest incarnation in a long line of tech-solutionist thinking. Direct and immediate harms experienced by people and ecosystems are ignored while potential future benefits are hyped. Computing is positioned as key to a “green transition,”<sup>84</sup> where tech giants are championed as accelerators of decarbonization and poised to further consolidate their market power as the vendors of sustainability solutions.<sup>85</sup>

Myths about AI create a policy vacuum in which unsustainable and unjust systems flourish and necessary policy interventions are delayed. To tackle climate change, environmental degradation, and its attendant injustices, Europe must reframe what it means to be innovative and center environmental justice in its industrial policy.

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### Myths of AI and Sustainability

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<sup>83</sup> Project Drawdown uses different scenarios to assess what determined, global efforts to address climate change might look like. Scenarios shown here are plausible and economically realistic. Drawdown Scenario 1 is roughly in line with a 2°C temperature rise by 2100, while Drawdown Scenario 2 is roughly in line with a 1.5°C temperature rise at century's end. AI's role in any of these solutions is limited, if needed at all. See “Table of Solutions,” Project Drawdown, accessed October 8, 2024, <https://drawdown.org/solutions/table-of-solutions>.

<sup>84</sup> Julie Sweet, “3 Ways to Harness the Power of Generative AI for the Energy Transition,” World Economic Forum, June 19, 2024, <https://www.weforum.org/agenda/2024/06/harness-power-generative-ai-energy-transition>; European Commission, “Accelerating the Green Transition: The Role of Digital Infrastructures in Decarbonising Energy and Mobility Sectors,” July 10, 2024, <https://digital-strategy.ec.europa.eu/en/news/accelerating-green-transition-role-digital-infrastructures-decarbonising-energy-and-mobility>.

<sup>85</sup> Michelle Thorne, *Critical Dependencies: How Power Consolidation of Digital Infrastructures Threatens Our Democracies—and What We Can Do About It*, Green Web Foundation, 2024, <https://www.thegreenwebfoundation.org/publications/report-critical-dependencies>. Alongside large cloud providers, the other big winners of “AI for climate” seem to be management consultant firms. From Boston Consulting Group to Accenture and McKinsey, these companies are expecting 20–40 percent of their consulting revenue to come from advising clients on how to use generative AI in 2024; many focus on sustainability applications.

Boosters of AI argue that the environmental costs of the technology are acceptable for the benefits they offer.<sup>86</sup> However, one should be wary of the rhetorical tactics used to defer meaningful climate action, known as discourses of delay.<sup>87</sup> This is an old story where the institutional pathology of neoliberalism tries to redirect attention, delay action, and dilute interventions away from truly transformative change. Here we unpack several prevailing myths about AI and sustainability, which we hope will equip policymakers with a more balanced take.

## 1. AI Is Immaterial

Cultural imaginations can portray AI as immaterial. However, it is anything but that. AI drives up the consumption of many key resources from energy to water to land and raw materials.

**Energy.** Data centers are the factories of AI,<sup>88</sup> and their rising energy demand (20–40 percent annually) gives insight into how much electricity is consumed. In the European Union, data center electricity consumption was estimated at 4 percent of the total EU electricity demand in 2022. By 2026, forecasts indicate it will be a third more, reaching almost 150 TWh.<sup>89</sup> Meanwhile, large AI providers underreport data center emissions by 660 percent, according to a recent investigation by the *Guardian*.<sup>90</sup>

**In some European countries such as Ireland, data centers already use a fifth of the countries' total electricity consumption.**<sup>91</sup>

**Water.** Less is known about water consumption of data centers, with less than a third of its operators reporting on it. Still, recent research revealed that training GPT-3 in Microsoft's state-of-the-art data centers directly evaporated 700,000 liters of clean freshwater.<sup>92</sup> It's estimated that ca. 500 ml of water is consumed for every 10–50

<sup>86</sup> Hannah Smith and Chris Adams, *Thinking About Using AI? Here's What You Can and (Probably) Can't Change About Its Environmental Impact*, Green Web Foundation, 2024, <https://www.thegreenwebfoundation.org/publications/report-ai-environmental-impact>.

<sup>87</sup> William F. Lamb, Giulio Mattioli, Sebastian Levi, J. Timmons Roberts, Stuart Capstick, Felix Creutzig, Jan C. Minx, Finn Müller-Hansen, Trevor Culhane, and Julia K. Steinberger, "Discourses of Climate Delay," *Global Sustainability* 3 (2020): e17, <https://doi.org/10.1017/sus.2020.13>.

<sup>88</sup> See Nathan Ensmenger, N. (2021) "The Cloud Is a Factory," in *Your Computer Is on Fire*, eds. Thomas S. Mullaney, Benjamin Peters, Mar Hicks, and Kavita Philip (Cambridge, MA: MIT Press 2021), 29–50, <https://doi.org/10.7551/mitpress/10993.003.0005>; and Max Schulze, Radika Kumar, and Michael Oghia, *Taxonomy Guide: Infrastructure in the Digital Economy*, Trade Competitiveness Briefing Paper, Commonwealth Secretariat, April 8, 2022, <https://www.thecommonwealth-ilibrary.org/index.php/comsec/catalog/book/952>.

<sup>89</sup> Eren Çam, Zoe Hungerford, Niklas Schoch, Francys Pinto Miranda, and Carlos David Yáñez de León, *Electricity 2024: Analysis and Forecast to 2026*, International Energy Agency, 2024, <https://iea.blob.core.windows.net/assets/ddd078a8-422b-44a9-a668-52355f24133b/Electricity2024-Analysisandforecastto2026.pdf>.

<sup>90</sup> Isabel O'Brien, "Data Center Emissions Probably 662% Higher than Big Tech Claims. Can It Keep Up the Ruse?" *Guardian*, September 15, 2024, <https://www.theguardian.com/technology/2024/sep/15/data-center-gas-emissions-tech>.

<sup>91</sup> George Kamiya and Paolo Bertoldi, *Energy Consumption in Data Centres and Broadband Communication Networks in the EU*, Publications Office of the European Union, February 16, 2024, <https://publications.jrc.ec.europa.eu/repository/handle/JRC135926>.

<sup>92</sup> Pengfei Li, Jianyi Yang, Mohammad A. Islam, and Shaolei Ren, "Making AI Less 'Thirsty': Uncovering and Addressing the Secret Water Footprint of AI Models," arXiv:2304.03271v3 [cs.LG], October 29, 2023, <https://arxiv.org/abs/2304.03271>.

responses in a typical session with ChatGPT3.<sup>93</sup> Projected freshwater demands for cooling data centers have utility companies scrambling to explore options for alternative water sources. There are freshwater usage reporting requirements in the EU Energy Efficiency Directive, but no legal obligation to reduce water use.<sup>94</sup>

**Depletion of materials and degradation of land from mining and e-waste.** While AI can work on conventional hardware, it has run up against the physical limits of cooling techniques and increasingly relies on new specialized CPUs. Facebook, through the Open Compute Project, pushes this hardware as the standard in data centers. These newer CPUs may be more efficient per calculation run, but they perform more computations and cumulatively consume larger amounts of resources.<sup>95</sup> Additionally, manufacturing new and more specialized hardware, instead of reusing existing hardware, generates substantial waste and pollution that severely impact the health of people near those sites.<sup>96,97,98,99</sup> These negative health and environmental impacts are experienced disproportionately by communities in the Majority World, continuing the practice of environmental colonialism.<sup>100</sup>

## 2. AI Will Speed Up the Transition

Given the urgent requirement to cut emissions,<sup>101</sup> we need evidence that AI is decarbonizing society rather than accelerating oil and gas extraction—of which there is abundant evidence.

<sup>93</sup> Ibid.

<sup>94</sup> Christoph Papenheim, "Water Usage and Efficiency in German Data Centers: A Regulatory Overview," Dentons, November 22, 2023, <https://www.dentons.com/en/insights/articles/2023/november/22/water-usage-and-efficiency-in-german-data-centers-a-regulatory-overview>.

<sup>95</sup> Nvidia's recent H100 AI accelerators hardware offers more performance per watt than predecessors, but also consumes significantly higher amounts of power. For more, see

Max Smolaks, "Nvidia's H100 – What It Is, What It Does, and Why It Matters," Data Center Knowledge, March 23, 2022, <https://www.datacenterknowledge.com/data-center-hardware/nvidia-s-h100-what-it-is-what-it-does-and-why-it-matters>.

<sup>96</sup> Sofia Benqassem, Frederic Bordage, Lorraine de Montenay, Julie Delmas-Orgelet, Firmin Doman, Etienne Lees Perasso, Damien Prunel, and Caroline Vateau, *Behind the Figures: Understanding the Environmental Impacts of ICT and Taking Action*, European Parliamentary Group of the Greens/EFA, December 7, 2021, [https://www.greens-efa.eu/files/assets/docs/ict\\_environmental\\_impacts-behind\\_the\\_figures-5low.pdf](https://www.greens-efa.eu/files/assets/docs/ict_environmental_impacts-behind_the_figures-5low.pdf).

<sup>97</sup> Stephani S. Kima, Xijin Xub, Yuling Zhangb, Xiangbin Zhengb, Rongju Liub, Kim N. Dietricha, Tiina Reponena, Changchun Xiea, Heidi Sucharew, Xia Huod, and Aimin Chen, "Birth Outcomes Associated with Maternal Exposure to Metals from Informal Electronic Waste Recycling in Guiyu, China," *Environment International* 137 (April 2020), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7257595>.

<sup>98</sup> Okunola A. Alabi, Yetunde M. Adeoluwa, and Adekunle A. Bakare, "Elevated Serum Pb, Ni, Cd, and Cr Levels and DNA Damage in Exfoliated Buccal Cells of Teenage Scavengers at a Major Electronic Waste Dumpsite in Lagos, Nigeria," *Biological Trace Element Research* 194, no. 1 (March 2020): 24–33, <https://pubmed.ncbi.nlm.nih.gov/31104299>.

<sup>99</sup> John-Michael Davis and Yaakov Garb, "A Strong Spatial Association Between E-Waste Burn Sites and Childhood Lymphoma in the West Bank, Palestine," *International Journal of Cancer* 144, no. 3 (February 1, 2019): 470–475, <https://doi.org/10.1002/ijc.31902>.

<sup>100</sup> Anil Agarwal and Sunita Narain, "Global Warming in an Unequal World: A Case of Environmental Colonialism," in *India in a Warming World: Integrating Climate Change and Development*, ed. Navroz K. Dubash (New Delhi: Oxford University Press, 2019), <https://doi.org/10.1093/oso/9780199498734.003.0005>.

<sup>101</sup> Adoption of the Paris Agreement, United Nations, 2015, [https://unfccc.int/sites/default/files/english\\_paris\\_agreement.pdf](https://unfccc.int/sites/default/files/english_paris_agreement.pdf).

AI burns fossil fuels in its operation, and more perversely it accelerates overall reliance on oil and gas extraction. Across Europe, data centers reserve very high amounts of the electricity grid's capacity, often much higher than actually used or needed.<sup>102</sup> In the overstretched energy systems of Europe, this practice of "air-booking" lays a fictive claim on grid capacity, preventing others from accessing (renewable) energy sources and pushing the narrative that there is a need for additional capacity. In addition, new gas-fired power plants are being built to meet the surging demand of power-hungry AI data centers,<sup>103</sup> shortening the lives of people living near the power plants and further locking society into an unhealthy fossil future.<sup>104</sup>

**AI for Big Oil.** No large technology company fully discloses its business with fossil fuels. Analysts anticipate AI spending in the oil and gas sector will double to \$2.7 billion by 2027,<sup>105</sup> with estimates that "more than 92% of oil and gas companies are either currently investing in AI or plan to in the next two years."<sup>106</sup> Karen Hao reports on Microsoft's sales of AI to oil supermajors like ExxonMobil, Chevron, and Shell to speed up the exploration and extraction of fossil fuels, netting Microsoft hundreds of millions of dollars and causing tens of millions of tons of emissions—multiples of their carbon removal work.<sup>107</sup>

### 3. AI is a Climate Solution

AI has a poor track record of delivering sustainability outcomes. "Solutions" are often unsubstantiated or gloss over the direct environmental impacts of implementing them. ICT sustainability expert Vlad Coroama describes the sector's lack of follow-through as "chronic potentialitis."

The argument that AI can green other sectors falls into a pattern where "technologies and paradigms [...] are positioned as solutions to climate and environmental crises, but actually perpetuate and intensify existing harms".<sup>108</sup> For example, in agriculture, AI is argued to be

<sup>102</sup> Julia Velkova, "Dismantling Public Values, One Data Center at the Time," Reimagining Public Values in Algorithmic Futures, University of Helsinki (blog), February 19, 2024,

<https://www.helsinki.fi/en/researchgroups/reimagining-public-values-in-algorithmic-futures/whats-new/dismantling-public-values-one-data-center-at-the-time>.

<sup>103</sup> Josh Saul, Naureen S. Malik, and Mark Chediak, "AI Boom Is Driving a Surprise Resurgence of US Gas-Fired Power," Bloomberg, September 16, 2024,

<https://www.bloomberg.com/news/articles/2024-09-16/us-natural-gas-power-plants-just-keep-coming-to-meet-ai-ev-electricity-demand>.

<sup>104</sup> Ariel Wittenberg, "Coal Power Kills a 'Staggering' Number of Americans," *Scientific American*, November 18, 2023,

<https://www.scientificamerican.com/article/coal-power-kills-a-staggering-number-of-americans>.

<sup>105</sup> Simon Cushing, James Ingham, and Inna Agamirzian, "Compare AI Software Spending in the Oil and Gas Industry, 2023–2027," Gartner Research, March 27, 2024, <https://www.gartner.com/en/documents/5318464>. "Global AI software spending in the oil and gas market is forecast to increase 24.3% in 2024 to \$1.5 billion and reach \$2.9 billion by 2027," the analysts note.

<sup>106</sup> "Applying AI in Oil and Gas," EY, survey removed from site; accessed at Internet Archive October 9, 2024,

[https://web.archive.org/web/20230816201206/https://www.ey.com/en\\_lb/applying-ai-in-oil-and-gas](https://web.archive.org/web/20230816201206/https://www.ey.com/en_lb/applying-ai-in-oil-and-gas).

<sup>107</sup> Karen Hao, "Microsoft's Hypocrisy on AI," *Atlantic*, September 13, 2024,

<https://www.theatlantic.com/technology/archive/2024/09/microsoft-ai-oil-contracts/679804>.

<sup>108</sup> Becky Kazansky and Nikita Kekana, "Coming Together to Counter Misleading and False Climate/Tech Solutions," *Branch* (blog), September 6, 2023, <https://branch.climateaction.tech/issues/issue-6/coming-together-to-counter-misleading-and-false-climate-tech-solutions>.

more efficient at spreading pesticides, which entangles farmers in Big Tech and prevents actual agricultural reform. This tactic relates to predatory delay, wherein climate action is postponed because of technological optimism, and misleads the public and decision makers about harms.<sup>109</sup>

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## Reframing Innovation and Industrial Policy: Toward Regenerativity

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In the face of predatory delay and these pervasive myths, policymakers must be able to counteract them with truly transformative, just, and sustainable solutions.

**The impacts of fossil fuels and water consumption from AI are not an engineering problem to be solved, but a question of environmental justice and democratic participation.**

Policymakers can strengthen existing measures. Extending end-of-life and reuse of hardware minimizes embodied environmental costs. Transparency wins, such as the EU's Corporate Sustainability Reporting Directive, should be enforced and implemented in other jurisdictions. Investment in renewable energy and carbon-aware computing practices should continue. Regulators must ensure AI companies and their supply chains publicly report on resource use and emissions across the full life cycle, including manufacture, training, and inference. Whistleblowers who might expose AI harms should be protected. Research into AI water strains on the freshwater supplies in Europe should be supported.<sup>110</sup>

Europe has an opportunity to reframe what it means to innovate and center people and the planet in its AI strategy. It can prioritize local, community-owned computational infrastructures over multinationals with highly concentrated power. It can advocate for meaningful connectivity and provide universal basic digital services. It can work with labor representatives and environmental groups to develop technology pathways that support workers and ecosystems in peaceful, prosperous ways. It can close the democratic deficit that determines our digital infrastructures—impacted communities need to be at the table

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<sup>109</sup> Alex Steffen, "Predatory Delay and the Rights of Future Generations," Medium, April 29, 2016, <https://medium.com/@AlexSteffen/predatory-delay-and-the-rights-of-future-generations-69b06094a16>.

<sup>110</sup> Michelle Thorne, "Critical Dependencies: How Power Consolidation of Digital Infrastructures Threatens Our Democracies—and What We Can Do About It," Green Web Foundation, 2024, <https://www.thegreenwebfoundation.org/publications/report-critical-dependencies/#ff080a85-a82a-4888-a2bb-e9a04d857f76>.

to decide where and how precious resources are allocated and decide which technologies should and could be part of their lives.