Redirecting Europe's AI Industrial Policy:
From Competitiveness to Public Interest

Europe's nascent industrial policy on AI is gaining steady momentum, potentially allocating significant public and private funds and shaping regulatory actions in ways that will set the trajectory for years to come. This effort needs urgent public scrutiny. That is where this report intervenes: to ask hard questions of how resources are allocated in these nascent strategies, the process by which priorities will be decided, and most fundamentally, to examine the premises underlying its vision. What kind of (digital) future does Europe want? What role can, and should, AI technologies play? And who will have a say in determining these answers? Rather than accept the narrow and poorly defined motivations of competitiveness and sovereignty that dominate conversations about AI, the authors in this collection redirect towards alternative pathways for Europe's AI industrial policy - challenging concentrated power in the tech industry rather than entrenching it, and foregrounding benefit to the public and the planet.

Table of Contents

Part III: Building Alternatives

Appendices

Executive Summary

As Europe's nascent industrial policy on AI gains steady momentum, potentially allocating significant public and private funds and shaping regulatory actions, we need public scrutiny and debate to assess these initiatives critically. That's where this report intervenes: to ask hard questions about the resource allocation in these nascent strategies and the process by which priorities will be decided; and, most fundamentally, to examine the premises underlying this vision

- How does the market structure of large-scale AI challenge traditional strategies for achieving digital independence?
- Is Europe's technological dependence on a few dominant incumbents reversible, or is the dependence structural?
- Do we have a robust evidence base to undergird the claims of AI's long-term benefits, including productivity gains and potential for breakthrough science?
- Does public investment in AI contradict Europe's social model and sustainability goals?
- Could the narrow focus on AI for public investment in technology create infrastructural lock-in?
- Is the rapid deployment of AI tools in sensitive social sectors necessary for the efficient delivery of public services, or does this raise more concerns than benefits?

This collection of essays and interviews by leading experts seeks to provide EU policymakers with policy research, perspectives, and evidence about the pitfalls and challenges that come with expanding public investment in the context of a highly concentrated global AI market. We also outline possible paths forward on competition, public digital infrastructure, and digital industrial and innovation policy more broadly. We will also explore what Europe's dependence on incumbents looks like, and how competitive Europe's AI market is in practice. While authors differ in their stances, backgrounds, and political positioning on these issues, they are united in showing that past tools and approaches are not fit for purpose.

Key recommendations

1. A Public-Interest Vision for AI in Europe

- The EU's AI strategy needs a coherent public-interest vision to help it move beyond the poorly defined and narrow motivations of sovereignty and competitiveness.
- This must start with rigorous scrutiny of the premise that investing in AI will lead to societal and economic benefit in the first place—including the pervasive (but empirically contested) claim of productivity gains.

2. Industrial Policy Should Challenge, Not Entrench, Existing Concentrations of Power in the AI Stack

- At minimum, industrial policy should be designed so that it doesn't worsen the concentrations of power in the AI stack by funneling public money to companies that already dominate the market.

3. Large-Scale AI as Inconsistent with Europe's Climate Goals

- Large-scale AI's current trajectory has serious climate impacts that might stand in irreconcilable tension with Europe's environmental and green transition goals.

4. Conditionalities to Industrial Policy are Essential to Ensure Public Benefit

- Public funding or access to other public resources (including land, water, and energy) must be attached to conditions that guarantee outcomes that serve the broader public interest.
- This includes accountability, climate, and labor conditionalities and standards. Conditionalities must be crafted through participatory processes that involve civil society, trade unions, and affected communities, with guaranteed transparency into the implementation of conditionalities.

5. Industrial Policy Must Not Promote Uncritical Application of AI Into Sensitive Social Domains

- Incentivizing blanket AI adoption in the public sector could contribute to a hollowing out of the state, a waste of public funds, single points of failure, and rights abuses, especially when deployed in risky contexts or in ways that are incompatible with AI's inherent limitations.

6. Innovation Grows with Bold Regulatory Enforcement

- Rather than pit innovation against regulation, industrial policy investments should move in tandem with bold regulatory enforcement, with the goal of shaping innovation in the public interest.

7. Europe's Place in the World: EU trade and industrial policy will have global ripple effects

- In what is perceived as an existential race for geopolitical influence and competitiveness vis-à-vis the US and China, and amid widespread fears of Europe's subordination, Europe must not lose sight of the many ways in which its policy orientation will shape the landscape of possibility, not just for the EU but also for the rest of the world. In particular, a neoliberal approach to digital trade policy could stifle an ambitious industrial policy strategy that prioritizes people and the planet.

Neither incremental change, nor significant investments into a predefined innovation trajectory, will benefit the public interest. Instead, European tech and innovation policy needs a radical reset. Europe must grapple with no less than existential questions about the direction and nature of its digital future. Answering these questions requires abandoning comfortable, established speaking points, superficial analyses, and bland statements that stand in for a serious discussion of what technology politics could be:

- What kind of (digital) future does Europe want?
- What role can, and should, AI technologies play in this future?
- Who will have a say in determining the path?

I. Reorienting European AI and Innovation Policy

by Frederike Kaltheuner, Leevi Saari, Amba Kak, and Dr. Sarah Myers West

Situating the Current Political Moment

The European Union stands on the brink of change. Its economic outlook remains uncertain, exacerbated by a cost-of-living crisis,[1] growing geopolitical tensions, the aftershocks of COVID-19 supply shortages, and an energy crisis caused by Russia's ongoing war against Ukraine. Despite numerous lawsuits, cases, and major court rulings against Big Tech, Europe has failed to meaningfully intervene in the lopsided and heavily concentrated global tech sector. Meanwhile, a rise of far-right political parties in key Member States challenges some of the core principles of the European project: the idea of an "ever closer union," democratic norms, fundamental rights, and the rule of law. Against this backdrop, the pressure is on for the new European Commission to deliver—not just on economic growth and prosperity, but on securing a more independent and competitive place in the world that could make the EU more resilient against future shocks.

Combined, these challenges have ignited a historical rethinking of the core tenets of EU economic policy, and a return to a more active statecraft in the form of industrial policy.[2] In September 2024, Mario Draghi, the former prime minister of Italy and the president of the European Central Bank, published his anticipated report on the competitiveness and future of the European Union. The report, in line with one published in April by another former Italian prime minister, Enrico Letta, calls for a transformative change in European policy to address the relative decline of the European Union, proposing an €800 billion increase in annual public and private investment, as well as reforms in trade, internal

---

[1] European Parliament, "Europeans Concerned by Cost of Living Crisis and Expect Additional EU Measures," press release, January 12, 2023, https://www.europarl.europa.eu/news/en/press-room/20230109IPR65918/europeans-concerned-by-cost-of-living-crisis-and-expect-additional-eu-measures.
[2] For why this is historically significant, see Max von Thun, "To Innovate or to Regulate? The False Dichotomy at the Heart of Europe's Industrial Approach," *AI Nationalism(s)*, AI Now Institute, March 12, 2024, https://ainowinstitute.org/publication/to-innovate-or-to-regulate-the-false-dichotomy.

market, and regulatory harmonization, among other proposals. To be sure, traditional regulatory levers are a part of this renovation, too—both Draghi's report and Commission President Ursula von der Leyen's political roadmap call for "a new approach to competition policy" that enables European companies to scale up and consolidate,[3] while also considering resilience and ensuring a level playing field. These calls have created a vibrant policy opening, in which interest groups are positioning themselves to shape this new industrial policy within existing political and institutional constraints.

AI & Industrial Policy in Europe

As we argue throughout this report, in the absence of a clear public interest vision for Europe's (technological) future, three scenarios become more likely: public money will be spent in contradictory, insufficient, or incoherent ways; public money will primarily benefit incumbent digital giants who already dominate the AI ecosystem; or (as Seda Gürses and Sarah Chander argue in Chapter V) public budgets will shift toward market-driven, surveillant, punitive, or extractive technologies that are framed as solutions for complex problems.

It is within this environment of anxieties around Europe's decline and pathways to its resurrection that AI has again risen to the front stage of policy. Its position as a laggard in the AI "race" has become a symbol for the continent's real and perceived lack of competitiveness and digital sovereignty, especially compared to the US and China. At the same time, AI's potential is situated as central to a whole range of complex problems the continent is facing: the climate crisis, slowing economic growth, and deteriorating public services.[4]

There is historical precedent for anxieties around national competitiveness encouraging more active industrial policies in Europe. Already in the 1970–80s, concerns over the decline in competitiveness against Japan and the United States led to familiar calls for increased investment in high-tech industries.[5] In 1993, Jacques Delors ascribed Europe's dire economic situation to a lack of investment in high-tech industries in the face of a

---

[3] Max von Thun, "Europe Must Not Tie Its Hands in the Fight Against Corporate Power," *Financial Times*, September 19, 2024, https://www.ft.Europe must not tie its hands in the fight against corporate powercom/content/cc4d2249-55af-4763-af7b-5a31cf254e2d.
[4] Although the EU's nascent industrial policy encompasses far more than just AI and digital transformation, artificial intelligence occupies a central place in the narrative about Europe's decline and possible resurrection.
[5] Filippo Bontadini et al., *EU Industrial Policy Report 2024*, Luiss Institute for European Analysis and Policy, September 2024, https://leap.luiss.it/luhnip-eu-industrial-policy-report-2024.

changing world.[6] Today, artificial intelligence forms a specific part of this competitiveness frame. In Draghi's narrative, the lack of EU hyperscalers and the dominance of US firms in foundation model development are emblematic of Europe's deficiencies and a continuation of previous failures to capitalize on technological waves. According to this narrative, this not only testifies to a lack of digital competitiveness and technological sovereignty but also risks Europe falling even further behind in global value chains. EU policymakers increasingly assume that investing in AI and integrating it into traditional industries is essential for generating economic growth and enhancing productivity across the EU.

Although it is still early days for industrial policy in this sector, initiatives are in motion that make for good case studies to tease out the early contours of the vision. Initiatives such as the European Commission's €3 billion innovation package for AI startups and SMEs, the European Chips Act, and the investment and regulatory recommendations outlined in the Draghi report highlight the EU's focus on fostering AI adoption across key industrial sectors and public services, while nurturing and growing regional and national AI economies—and the industries that underpin them. In practice, this includes plans to unlock new financing from private and public sources, build and coordinate European AI capacities (diffusing them across selected industries), cut down regulatory barriers, and harmonize the European market for AI.

While we're still some way from a clear and coherent vision animating these public investments in AI, a few features are already coming to the fore. For one, AI—particularly large-scale AI—is viewed as a technology where EU companies still have a fighting chance at leadership, and efforts seem to be directed at identifying these winning niches. There are stray references to broader social and environmental goals—like the Draghi report positioning AI as key to defending the EU's social model and enabling the green transition—but, as we explore in this collection, these claims are largely asserted and the assumptions don't stand up to scrutiny.

---

[6] Paul Krugman, "Competitiveness: A Dangerous Obsession," *Foreign Affairs*, March 1, 1994, https://www.foreignaffairs.com/articles/1994-03-01/competitiveness-dangerous-obsession.

Status Quo: Where Does Europe Stand on AI?

Despite Europe's lack of homegrown digital platforms that marked the latest phase of the digital economy, in policy debates European AI startups are still often seen as potentially on a path to catching up with their US competitors due to the EU's long tradition of academic research and expertise. The public attention garnered by exemplars like France's Mistral AI and Germany's Aleph Alpha, as well as dreams of building a European large-scale AI, however, obscure how intertwined with the global AI stack the European AI market is.

The large-scale AI market as we know it today is characterized by both horizontal and vertical concentration of power. Incumbent digital firms shape key inputs to large-scale AI: computing, data, capital, and talent; as well as distribution networks to access customers, risking further entrenchment or expansion of their market power.[7] As a result, most leading AI startups, such as Anthropic and OpenAI, have entered into lopsided partnerships with tech giants, trading financial and compute capacity for access to their models. Potential competitors in the downstream AI market, such as Adept, Character.ai, or Inflection AI have recently been de facto acquired by the large hyperscalers with mergers and agreements that effectively sidestep merger regulations.[8] And while global competition authorities have raised concerns around the negative impacts of these business arrangements, they've stopped short of issuing remedies that would truly curtail their power or restructure the market toward a more level playing field.[9]

Large US incumbents are uniquely positioned to shape the direction of downstream large-scale AI innovation. In the US, for instance, corporate giants Microsoft, Google, and Amazon vastly outspent traditional Silicon Valley investors in deals with AI startups in 2023.[10] In addition, beyond directly managing the inputs and distribution of the AI supply-chain, Big Tech also shapes the market indirectly. By dominating the AI ecosystem, it shapes the incentives and strategies of other actors through deterring entry to certain

---

[7] Federal Trade Commission, "FTC, DOJ, and International Enforcers Issue Joint Statement on AI Competition Issues," press release, July 23, 2024,
https://www.ftc.gov/news-events/news/press-releases/2024/07/ftc-doj-international-enforcers-issue-joint-statement-ai-competition-issues.

[8] Alex Heath, "This is Big Tech's Playbook for Swallowing the AI Industry," *Verge*, July 1, 2024,
https://www.theverge.com/2024/7/1/24190060/amazon-adept-ai-acquisition-playbook-microsoft-inflection.

[9] Competition authorities such as the EU Directorate-General of Competition (DG COMP), the UK's Competition and Markets Authority (CMA), and the Federal Trade Commission (FTC) have argued that such strategic investments and partnerships can undermine competition and manipulate market outcomes to their advantage. See Federal Trade Commission, "FTC, DOJ, and International Enforcers Issue Joint Statement on AI Competition Issues."

[10] George Hammond, "Big Tech Outspends Venture Capital Firms in AI Investment Frenzy," *Financial Times*, December 29, 2024,
https://www.ft.com/content/c6b47d24-b435-4f41-b197-2d826cce9532.

markets, encouraging innovation trajectories that complement their existing offering and nurturing competition in what Cecilia Rikap calls "periphery,"[11] the startup orbit that gradually gets increasingly entangled with these ecosystems. The "level playing field," a staple of EU policy talk, remains an elusive mirage.

In our research, we have observed a number of ways in which European companies have tried to position themselves vis-à-vis this dominant ecosystem.

Nascent European AI companies tend to move away from the purportedly capital-intensive business of training cutting-edge AI models toward downstream applications, developing software applications that depend on existing models and cloud infrastructure. The majority of closed foundation models are still developed in the US. The largely French and German startups in our sample, like Mistral AI and DeepL, and newer initiatives like Black Forest Labs or Poolside are the exception in that they are still competing on large-scale model making. The increasing costs of training and the wide availability of commoditized open-source models like Meta's Llama series, however, have challenged paid subscription-based business models. For companies, the benefit of developing their own models might be crowded out by the increasingly capable open source models. Some high-profile examples in Europe, such as Aleph Alpha, recently announced a shift away from training their own models to pivot toward AI support and facilitation.[12] Also, companies still developing their own models, like Mistral, are also hinting at moving toward providing a platform for developers to use as the key product.[13] These examples signal a further potential consolidation in the number of companies developing large-scale AI models.[14]

In an effort to avoid directly competing with the hyperscale ecosystems and their dominance over distribution networks, European AI companies have tried to position themselves toward alternative or complementary markets. This has meant focusing on specific markets by, for example, selling AI systems directly to large businesses[15] and

---

[11] Cecilia Rikap, "Dynamics of Corporate Governance Beyond Ownership in AI," Common Wealth, May 15, 2024, https://www.common-wealth.org/publications/dynamics-of-corporate-governance-beyond-ownership-in-ai.

[12] Mark Bergen, "The Rise and Pivot of Germany's One-Time AI Champion," Bloomberg, September 5, 2024, https://www.bloomberg.com/news/articles/2024-09-05/the-rise-and-pivot-of-germany-s-one-time-ai-champion.

[13] See the comment by Mistral's cofounder in a recent interview: "This is the product that we are building: the developer platform that we host ourselves, and then serve through APIs and managed services, but that we also deploy with our customers that want to have full control over the technology, so that we give them access to the software, and then we disappear from the loop. So that gives them sovereign control over the data they use in their applications, for instance." Will Henshall, "Mistral AI CEO Arthur Mensch on Microsoft, Regulation, and Europe's AI Ecosystem," *Time*, May 22, 2024, https://time.com/7007040/mistral-ai-ceo-arthur-mensch-interview.

[14] Here, however, some important initiatives in the EU AI ecosystem are developing completely open source models. See Romain Dillet, "Kyutai Is a French AI Research Lab with a $330 Million Budget That Will Make Everything Open Source," *TechCrunch*, November 17, 2023, https://techcrunch.com/2023/11/17/kyutai-is-an-french-ai-research-lab-with-a-330-million-budget-that-will-make-everything-open-source.

[15] "An LLM fine-tuned for your use case," Silo AI, accessed October 12, 2024, https://www.silo.ai/silogen.

governments;[16] integrating artificial intelligence with existing industrial products; or cooperating with sectoral champions—see for instance Owkin's partnership with Sanofi on drug discovery,[17] or the partnership between Saab and military AI startup Helsing.[18] These efforts are expected to intensify through Draghi's newly proposed initiative EU Vertical AI Priorities Plan. The plan supports vertical cooperation in AI adoption "while duly safeguarded from EU antitrust enforcement, to encourage systematic cooperation between leading EU companies for generative AI and EU-wide industrial champions in key sectors" such as automotive, manufacturing, and telecoms.[19] While less visible than the customer-facing generative AI offerings, these industrial partnerships form a substantial part of the reality of the European AI ecosystem.

European companies also attempt to differentiate themselves through alternative moats. Instead of pushing the frontier of AI within the current paradigm of building ever-larger models and chasing state-of-the-art model capabilities, European companies emphasize compliance, trust, control, sovereignty, calibrated models, customization, and "Europeanness" as a competitive advantage in the market. A nascent ecosystem of auditing, compliance, and assurance is emerging in which compliance with applicable European regulations is used as one way to protect the market share of European companies.[20] This might create new pressures to streamline the interpretation of the key regulations in a way that is conducive to the interests of European AI companies, while still maintaining the competitive advantage vis-à-vis US hyperscalers. However, the long-term sustainability of these moats against the creeping consolidation of the global AI ecosystem is still uncertain, with leading hyperscalers positioning in these markets as well.[21]

---

[16] See "PhariaAI: The Sovereign Full-Stack Solution for Your Transformation Into the AI Era," Aleph Alpha, accessed October 12, 2024, https://aleph-alpha.com/phariaai.

[17] See Owkin, "Owkin Expands Collaboration with Sanofi to Apply AI for Drug Positioning in Immunology," press release, March 21, 2024, https://www.owkin.com/newsfeed/owkin-expands-collaboration-with-sanofi-leveraging-ai-for-drug-positioning-in-immunology.

[18] Saab, "Saab Signs Strategic Cooperation Agreement and Makes Investment in Helsing," press release, September 14, 2023, https://www.saab.com/newsroom/press-releases/2023/saab-signs-strategic-cooperation-agreement-and-makes-investment-in-helsing.

[19] European Commission, *The Future of European Competitiveness: Part B, In-Depth Analysis and Recommendations*, September 2024, 83, https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en.

[20] See "Aleph Alpha Launches PhariaAI: The Enterprise-Grade Operating System for Generative AI Combining Future-Proof Sovereign Design with LLM Explainability and Compliance," Aleph Alpha, August 26, 2024, https://aleph-alpha.com/aleph-alpha-launches-phariaai-the-enterprise-grade-operating-system-for-generative-ai-combining-future-proof-sovereign-design-with-llm-explainability-and-compliance; and Emmanuel Cassimatis, "SAP Continues to Expand Its Partnership with Mistral AI to Broaden Customer Choice," SAP, October 9, 2024, https://news.sap.com/2024/10/sap-mistral-ai-partnership-expands-broaden-customer-choice.

[21] See Takeshi Numoto, "Microsoft Trustworthy AI: Unlocking Human Potential Starts with Trust," Microsoft (blog), September 24, 2024, https://blogs.microsoft.com/blog/2024/09/24/microsoft-trustworthy-ai-unlocking-human-potential-starts-with-trust; "Introducing ChatGPT Enterprise," OpenAI, August 28, 2023, https://openai.com/index/introducing-chatgpt-enterprise; and "Delivering Digital Sovereignty to EU Governments," sponsored content from Microsoft, *Politico*, accessed October 12, 2024, https://www.politico.eu/sponsored-content/delivering-digital-sovereignty-to-eu-governments.

Nvidia hardware used by majority of cloud intermediary firms

Source: AI Now, 2024

Investors in EU Startups by Type and Nationality

Source: Factset, AI Now, 2024
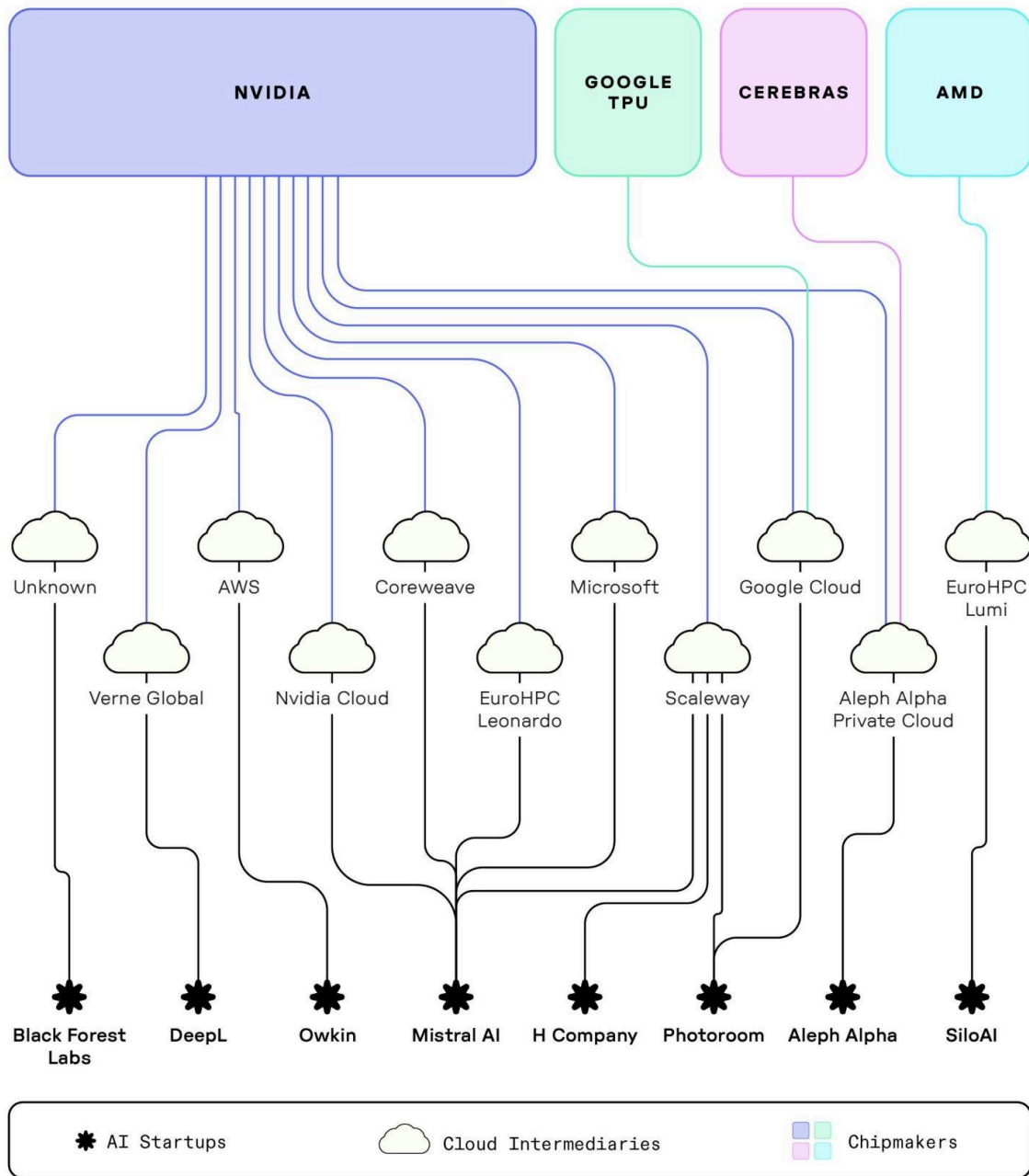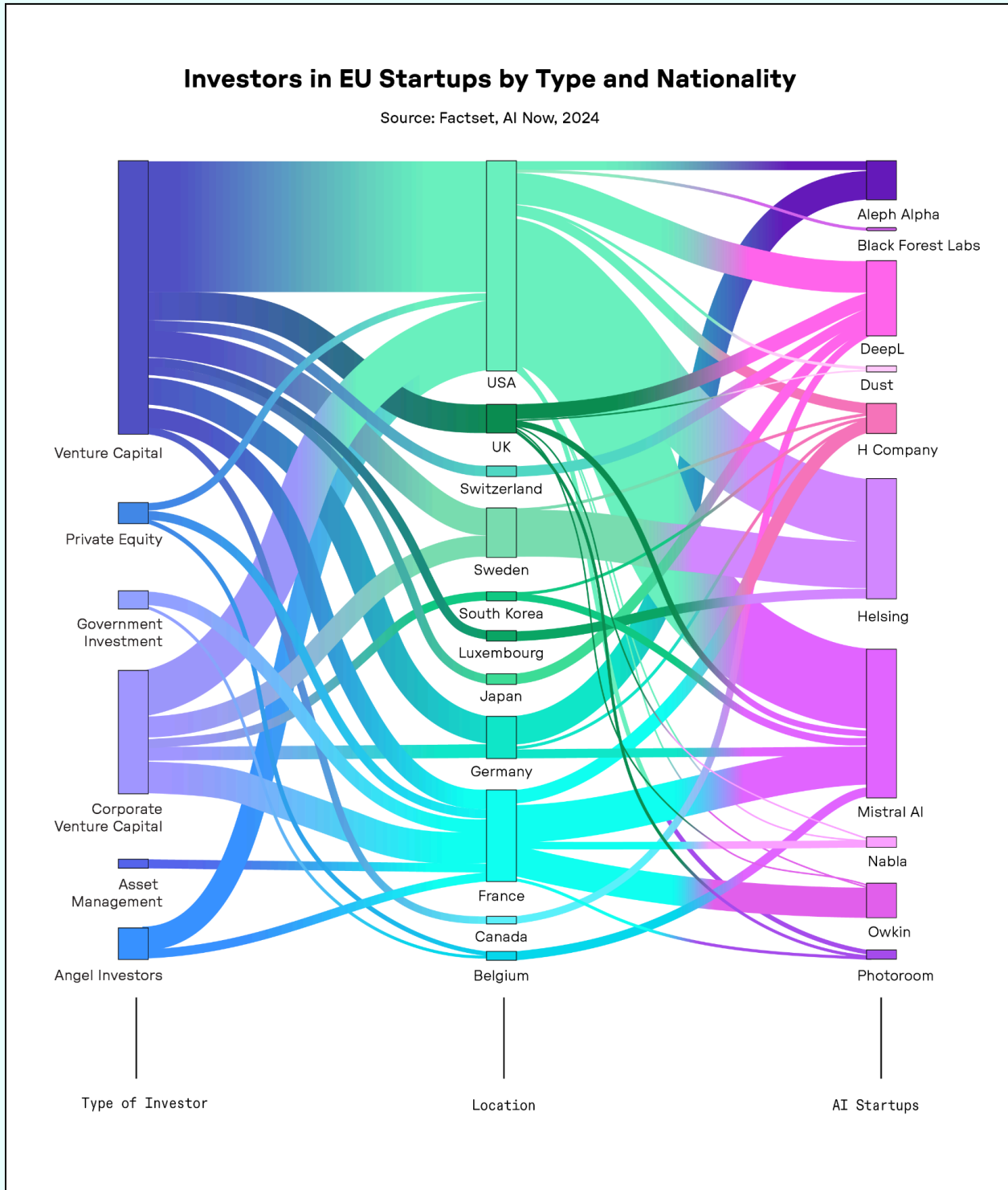
Analysis of a sample of the European AI market shows that early- and growth-stage sources of capital in the European AI market are more variegated than in the United

States. In our sample of prominent EU AI companies, finance in the scale-up and growth phases consists of a mixture of local billionaires,[22] public funding through national development banks,[23] existing sectoral champions,[24] corporate venture investments,[25] and international (primarily US) venture capital.[26]

These patterns lead to a different and more complex political economy in AI development, with different actors, timescales to profitability, and logics of operation than US AI startups, whose funding is often anchored in the existing surpluses of tech giants.[27] However, for the scale-up phase, Europe lacks the equivalent of Silicon Valley, in which corporate giants and a deep venture capital ecosystem have underwritten the stupefying costs of scalable AI infrastructure. This perceived gap has led to recent calls to free up the assets in European pension and insurance funds to facilitate the scaling of European AI start-ups through strengthening the capital markets union and relaxing financial regulations.[28] This creates new beneficiaries and reorients capital flows in European capital markets.

Unlike in the United States, in Europe there is some diversity in the compute ecosystem underpinning the training and inference of AI models. In our sample, we noticed that some EU companies are trying to manage their dependence on hyperscalers. Instead of leaning heavily on Microsoft, Google, and Amazon, such companies are instead opting for a mix of public and private computing resources; a multicloud strategy; and reliance on alternative, smaller compute providers known as *neoclouds*.[29] While this points to some diversity in medium-sized compute providers, on a deeper level the landscape is

---

[22] See Miriam Partington, "Germany's Richest Man Wants to Ensure Europe Has an OpenAI Rival," *Sifted*, October 26, 2023, https://sifted.eu/articles/heilbronn-franken-ai; and Mark Bergen, "French Billionaire Xavier Niel Is Building a ChatGPT Competitor with a 'Thick French Accent'," Bloomberg, July 4, 2024, https://fortune.com/europe/2024/07/04/ai-lab-french-billionaire-xavier-niel-takes-on-chatgpt-reveals-voice-assistant-with-thick-french-accent.

[23] Bpifrance, "Bpifrance Supports French Companies in the Artificial Intelligence Revolution," June 30, 2023, https://www.bpifrance.com/2023/06/30/bpifrance-supports-french-companies-in-the-artificial-intelligence-revolution.

[24] See Saab, "Saab Signs Strategic Cooperation Agreement and Makes Investment in Helsing"; and Owkin, "Owkin Becomes 'Unicorn' with $180M Investment from Sanofi," press release, November 18, 2021, https://www.owkin.com/newsfeed/owkin-becomes-unicorn-with-180m-investment-from-sanofi-and-four-new-collaborative-projects.

[25] Kyle Wiggers, "AI Coding Startup Poolside Raises $500M from eBay, Nvidia, and Others," *TechCrunch*, October 2, 2024, https://techcrunch.com/2024/10/02/ai-coding-startup-poolside-raises-500m-from-ebay-nvidia-and-others.

[26] See Jeannette zu Fürstenberg, Hemant Taneja, Quentin Clark, and Alexandre Momeni, "Tripling Down on Mistral AI," General Catalyst, June 11, 2024, https://www.generalcatalyst.com/perspectives/tripling-down-on-mistral-ai; Lightspeed, "Partnering with Helsing, Europe's Leader in AI Enabled Defense," July 11, 2024, https://lsvp.com/stories/partnering-with-helsing-europes-leader-in-ai-enabled-defense; and Supantha Mukherjee, "VC Firm Accel Raises $650 Mln to Invest in AI, Cybersecurity Startups," Reuters, May 13, 2024, https://www.reuters.com/business/finance/vc-firm-accel-raises-650-mln-invest-ai-cybersecurity-startups-2024-05-13.

[27] For instance, research has identified some key limitations in the kinds of technologies the VC-funding model is equipped to fund. Due to the short-term nature and rapid scalability imperative underlying the VC funding model, the investments are often directed at readily commercializable products, such as software and products. More transformative and long-term investments, such as the buildup of public digital infrastructure, do not easily fit this framework. See Josh Lerner and Ramana Nanda, "Venture Capital's Role in Financing Innovation: What We Know and How Much We Still Need to Learn," *Journal of Economic Perspectives* 34, no. 3 (Summer 2020): 237–261, https://www.aeaweb.org/articles?id=10.1257/jep.34.3.237.

[28] Chiara Fratto, Matteo Gatti, Anastasia Kivernyk, Emily Sinnott, and Wouter van der Wielen, "The Scale-Up Gap: Financial Market Constraints Holding Back Innovative Firms in the European Union," European Investment Bank, July 2024, https://www.eib.org/attachments/lucalli/20240130_the_scale_up_gap_en.pdf.

[29] Dylan Patel and Daniel Nishball, "AI Neocloud Playbook and Anatomy," SemiAnalysis, October 3, 2024, https://www.semianalysis.com/p/ai-neocloud-playbook-and-anatomy.

centralized. The majority of the computation clusters are fitted with Nvidia GPUs most efficient for large-scale training, with competitors such as AMD and Intel attempting to make a dent in this ecosystem by acquiring their own large-scale AI model providers.[30] This points to the sustained and centralized material dependencies underpinning the current AI ecosystem.[31] The EUV lithography machines manufactured by the Dutch corporation ASML, which are required for the production of leading-edge chips, are the almost singular European lever in this material AI ecosystem. Hence, after the lessons learned from the Chips Act fiasco with Intel (see Margarida Silva and Jeroen Merk's contribution), the available EU policy interventions to shape the material constraints of AI ecosystems seem to be largely limited to using regulation or procurement policy to kindle competition among existing, non-European hardware providers by placing relatively modest orders for the European High Performance Computing (EuroHPC) clusters.

This flicker of diversity vanishes as scale increases. As European AI companies attempt to scale to the global customer-facing market, they are inexorably pulled to the orbit of the hyperscalers. To reach a sufficient customer base for a sustainable business model and get access to the computation needed to run large-scale AI inference at scale, the path to profitability goes through Big Tech. This explains why European AI companies like Mistral form partnerships with Microsoft,[32] or why Silo AI offers its Viking models in Google Cloud.[33] The new model gardens offered by hyperscalers, such as Google's Vertex AI Garden, Microsoft's AI Azure, or Amazon Bedrock, become the primary way for developers to access the large-scale AI models manufactured by the hyperscalers themselves or produced by third-party providers. This platforming replays the logic of the previous waves of digital consolidation that turned hyperscalers into global digital champions.

The European AI market is a complex and constantly evolving space, striving to coexist within a highly concentrated large-scale AI ecosystem that heavily favors dominant digital firms, which are actively shaping the innovation trajectory of AI to serve their own interests. In this parasitic relationship, the trajectory of European AI is both indirectly and directly shaped by the logic of a highly concentrated global AI market. Taking this into

---

[30] AMD, "AMD Completes Acquisition of Silo AI to Accelerate Development and Deployment of AI Models on AMD Hardware," press release, August 12, 2024, https://www.amd.com/en/newsroom/press-releases/2024-8-12-amd-completes-acquisition-of-silo-ai-to-accelerate.html https://stability.ai/news/building-new-ai-supercomputer.

[31] Jai Vipra and Sarah Myers West, "Computational Power and AI: Comment Submission," *Computational Power and AI*, June 22, 2023, AI Now Institute, https://ainowinstitute.org/publication/policy/computational-power-and-ai.

[32] See Eric Boyd, "Microsoft and Mistral AI Announce New Partnership to Accelerate AI Innovation and Introduce Mistral Large First on Azure," Microsoft (blog), February 26, 2024, https://azure.microsoft.com/en-us/blog/microsoft-and-mistral-ai-announce-new-partnership-to-accelerate-ai-innovation-and-introduce-mistral-large-first-on-azure.

[33] See "Silo AI Releases Viking on Google Cloud: A New Open Large Language Model for Nordic Languages and Code," Silo AI (blog), last updated June 11, 2024, accessed October 12, 2024, https://www.silo.ai/blog/silo-ai-releases-viking-on-google-cloud-a-new-open-large-language-model-for-nordic-languages-and-code.

account helps us understand the potential and likely trajectories of European AI ecosystems.

Key Themes

Theme: A Public-Interest Vision for AI in Europe

The EU's AI strategy needs a coherent public-interest vision to help it move beyond the poorly defined and narrow motivations of sovereignty and competitiveness.

This must start with rigorous scrutiny of the premise that investing in AI will lead to societal and economic benefit in the first place—including the pervasive (but empirically contested) claim of productivity gains.

The promises of exponential AI-generated productivity growth are the common parlance of tech industry leaders and business-sector forecasters, whereas more careful analysis has identified significant—but more modest—productivity gains.[34] Indeed, the monomaniacal push for increased adoption of automation technologies has not always been a positive economic force,[35] leading to increased costs, increased inequality, and reduced resilience without corresponding increases in welfare.[36] The relationship between rapid AI adoption, investments in AI, and an increase in productivity and economic growth are anything but self-evident, especially in a context as diverse as the various national economies of the European Union, and given that most leading European AI-startups are based in Germany and France. This calls for vigorous debate.

Further complicating matters is the fact that EU discussions of AI competitiveness are mired in unclear definitions, which leads the debate astray. "Competitiveness," regardless of how self-evident the term may seem, has repeatedly been found to collapse upon further scrutiny. "A meaningless term when applied to national economics," and "a dangerous obsession," is how the economist Paul Krugman described competitiveness in response to former Commission President Jacques Delors's preoccupation with the

---

[34] Daron Acemoglu, "Don't Believe the AI Hype," *Project Syndicate*, May 21, 2024, https://www.project-syndicate.org/commentary/ai-productivity-boom-forecasts-countered-by-theory-and-data-by-daron-acemoglu-2024-05.
[35] Lorraine Daston, *Rules: A Short History of What We Live By* (Princeton: Princeton University Press,2022), 1–384.
[36] Daron Acemoglu and Pascual Restrepo, "Tasks, Automation, and the Rise in US Wage Inequality," *Econometrica* 90, no. 5 (September 2022): 1973–2016, https://doi.org/10.3982/ECTA19815.

concept in the early 1990s. While the matter is not straightforward, it is important to keep in mind that countries, or economic blocs, do not compete like players on a field; rarely is it even obvious who the players are and what the game ought to be. A similar ambiguity applies to both "sovereignty" and the term "artificial intelligence." Calling for blanket adoption of "AI" conceals significant differences in resource requirements between large-scale AI and smaller machine learning models. "Sovereignty" is often used interchangeably with the terms *state sovereignty*, *data sovereignty*, or *strategic autonomy*, with unclear, and at times contradictory, implications for what sovereign technology should look like.[37] Similar tensions play out even around terms like *digital public infrastructures*, which are being driven by multiple distinct (and sometimes conflicting) institutional interests. As Zuzanna Warso warns in Chapter XII, the push for digital public infrastructure risks emphasizing fragmented digitization at the expense of prioritizing public attributes, public functions, and public ownership of digital infrastructure. If investments in digital infrastructure are driven by an aspirational desire to lead in large-scale AI development, the bet is particularly risky—as the infrastructure for training large-scale models cannot easily be repurposed for other kinds of uses.

All of these factors should give us pause to reflect on the terms currently framing the debate. We need a more critical and inclusive debate about which public, and whose interest, European industrial policy on AI is intended to serve.[38] In her chapter sketching out a vision for the EuroStack, an increasingly popular moniker for publicly funded alternative infrastructure, Francesca Bria foregrounds the question of whose needs these infrastructures serve: "Ultimately, the EuroStack is not just a technological project—it is a political one." The EU must critically assess who is set to benefit from AI leadership aspirations and which constituencies will have a say in shaping this vision.

Theme: Industrial Policy Should Challenge, Not Entrench, Existing Concentrations of Power in the AI Stack

At minimum, industrial policy should be designed so that it doesn't worsen the concentrations of power in the AI stack by funneling public money to companies that already dominate the market.

---

[37] Johan David Michels, Christopher Millard, and Ian Walden, "On Cloud Sovereignty: Should European Policy Favour European Clouds?" Queen Mary Law Research Paper, no. 412, November 10, 2023, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4619918.
[38] Daniel Mügge, "EU AI Sovereignty: For Whom, to What End, and to Whose Benefit?" *Journal of European Public Policy* 31, no. 8 (2024): 2200–2225, https://www.tandfonline.com/doi/full/10.1080/13501763.2024.2318475.

Any vision for the values and goals that should drive Europe's industrial strategy on AI needs to seriously wrestle with concentrated power and the entanglements within the AI ecosystem. Without doing so, there is a real risk that public money will end up primarily flowing toward the companies that already dominate the market, something we have already seen in past interventions like the European Chips Act, or in the early proposals in the United States to develop public computing capacity.[39] Reflecting on the shortcomings of Gaia-X, Europe's attempt to build a sovereign cloud, in his chapter, Francesco Bonfiglio calls for a paradigm shift away from building national champions towards prioritizing physical infrastructure and a federated approach towards the cloud. From the failure to aggressively seek competition remedies that tackle concentrated power in the AI market, to a resignation to the dominance of and dependence on US hyperscalers and their version of what a "sovereign cloud" could look like, to calls for an emphasis on scale as beneficial for innovation and resilience,[40] the Commission is not giving concentrated power in AI the attention it deserves.

One reason for this may be that the complex ways incumbents expand and abuse their power aren't sufficiently addressed in Europe. Cecilia Rikap suggests thinking of the AI market as an "entrenched and established core of Big Tech surrounded by a turbulent periphery." From this perspective, even a seemingly thriving EU market of startups that builds models or applications would not challenge but reinforce the high degree of concentration we see in the large-scale AI market already: being located at the core allows hyperscalers and Big Tech firms to leverage their control over data, distribution networks, and computing infrastructure to "skew the innovation trajectory and profit flows" in their direction.

In Chapter III, Cristina Caffarra argues that the conventional rules that are traditionally applied to merger enforcement in Europe will inevitably fail to capture the essence of concerns around Big Tech dealmaking with AI companies. Regulators will need to move beyond traditional narrow, *post hoc* antitrust analysis and deploy a fitting theory of harm to name an increasingly clear dynamic: by aggressively "weaponizing" their scaled assets into new applications, Big Tech firms and their ecosystems entrench their first-mover advantages and effectively preempt competition from challengers.

---

[39] AI Now Institute and Data and Society Research Institute "Democratize AI? How the Proposed National AI Research Resource Falls Short," *AI Industrial Policy*, AI Now Institute, October 5, 2021, https://ainowinstitute.org/publication/democratize-ai-how-the-proposed-national-ai-research-resource-falls-short.
[40] Von Thun, "Europe Must Not Tie Its Hands in the Fight Against Corporate Power."

Theme: Large-Scale AI as Inconsistent with Europe's Climate Goals

Large-scale AI's current trajectory has serious climate impacts that might stand in irreconcilable tension with Europe's environmental and green transition goals.

In European policy discussions, investing in AI is often framed as a necessity to achieve Europe's climate goals, either directly by using "AI for good" to fight climate change, or indirectly by securing the prosperity Europe needs to fund the "green transition." In Chapter IV, Fieke Jansen and Michelle Thorne show how the climate implications of large-scale AI pose an existential question for this particular technological trajectory. The production of chips and the operation of data centers are both energy-intensive and environmentally damaging and in some European countries, such as Ireland, data centers already use a fifth of the countries' total electricity consumption.[41] The recent massive global investments in AI and data infrastructures are poised to exacerbate this situation even further.[42]

In this context, positioning AI as a climate solution is not just misleading; it also distracts from an urgent policy priority, allowing unsustainable and inequitable systems to thrive while delaying crucial policy actions. Given the Commission's continued (albeit weakened[43]) commitment to a green and just transition, aspiring to global leadership in AI seems counterproductive. Jansen and Thorne suggest that Europe needs to redefine innovation by placing environmental justice at the core of its industrial policy.

The sustainability question is not just of regional importance. If Europe decides to bet on large-scale AI, environmental exploitation in its supply chain, particularly of raw materials, will be felt elsewhere. As UN Trade and Development (UNCTAD) stated in their 2024 report on the digital economy, "developing countries bear the brunt of the environmental costs of digitalization while reaping fewer benefits."[44]

---

[41] 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.

[42] Microsoft Source, "BlackRock, Global Infrastructure Partners, Microsoft and MGX Launch New AI Partnership to Invest in Data Centers and Supporting Power Infrastructure," press release, September 17, 2024, https://news.microsoft.com/2024/09/17/blackrock-global-infrastructure-partners-microsoft-and-mgx-launch-new-ai-partnership-to-invest-in-data-centers-and-supporting-power-infrastructure.

[43] WWF, "Von der Leyen Secures Second Term, Diluted European Green Deal Lives On," July 18, 2024, https://www.wwf.eu/?14383941/Von-der-Leyen-secures-second-term-diluted-European-Green-Deal-lives-on.

[44] *2024 Digital Economy Report: Shaping an Environmentally Sustainable and Inclusive Digital Future*, United Nations Conference on Trade and Development, 2024, https://unctad.org/publication/digital-economy-report-2024.

Theme: Conditionalities to Industrial Policy are Essential to Ensure Public Benefit

Public funding or access to other public resources (including land, water, and energy) must be attached to conditions that guarantee outcomes that serve the broader public interest. This includes accountability, climate, and labor conditionalities and standards. Conditionalities must be crafted through participatory processes that involve civil society, trade unions, and affected communities, with guaranteed transparency into the implementation of conditionalities.

Europe's newfound embrace of industrial policy is often framed in opposition to what has come before: a focus on regulation instead of, or even at the expense of, investing in alternatives. However, industrial policy never truly went away in Europe. Over the course of the Digital Decade that is about to come to an end, Europe has invested billions in flagship projects like the European sovereign cloud Gaia-X, acted as a key player in European venture capital markets, and allocated billions of euros to research and development through Horizon Europe and Digital Europe Programs.

History tells us that without emphasis on conditionalities and accountability, industrial policy will work to serve narrow industry interests at the expense of the broader public. Europe's previous ventures into industrial policy are no exception. Both the European Chips Act and the innovation package for AI startups and SMEs show that past EU attempts to invest in AI economies and the infrastructures that underpin them have left concentrated power in the AI stack largely unaddressed, and have instead solidified the role of a few incumbents. In Chapter VI, drawing from investigations done by the Centre for Research on Multinational Corporations, Margarida Silva and Jeroen Merk show how the EU Chips Act failed to impose social, environmental, or redistributive conditions on the public subsidies granted, and excluded the public from both the negotiations and the ability to scrutinize the resulting agreements. Combined, this led to the threat of regulatory capture by well-positioned companies.

Conditionalities could also require *meaningful* openness in the development and release of publicly funded AI projects. But as Udbhav Tiwari argues in Chapter IX, for open source initiatives to meaningfully challenge concentrated power and the trend toward homogeneity, there will also need to be a focus on shifting broader structural conditions in the market, including via robust antitrust enforcement.

What different calls for conditionalities have in common is the involvement of a much more diverse public. In fact, this is also something Draghi calls for: strong social dialogue that fosters collaboration among trade unions, employers, and civil society, considered essential for setting goals and actions to transform Europe's economy toward greater inclusivity and equity. Making these commitments a tangible reality is a true challenge for European tech policy in the coming years.

Theme: Industrial Policy Must Not Promote Uncritical Application of AI Into Sensitive Social Domains

Incentivizing blanket AI adoption in the public sector could contribute to a hollowing out of the state, a waste of public funds, single points of failure, and rights abuses, especially when deployed in risky contexts or in ways that are incompatible with AI's inherent limitations.

Europe's ambition to boost the adoption of AI in the public sector is premised on the assumption that AI will improve public services. Beyond unclear definitions—it is unclear whether "improvement" means better quality or cheaper delivery—such hopes need to be grounded in empirical evidence about the actual capabilities, benefits, and inherent limitations of AI technologies and their ability to increase the quality and efficiency of public services. This evidence is frequently lacking.[45] Instead, a rich body of research, including from the European Union, has documented the risks and harms associated with using AI to cut costs in the public sector. In 2019, for instance, Philip Alston, the UN special rapporteur on extreme poverty and human rights, warned that the rapid digitization and automation of welfare systems is harming the poorest and most vulnerable people in society.[46] The European Anti-Poverty Network has coined the term "digitally induced poverty," a phenomenon induced through a combination of the automation of discrimination, digital exclusion, and digitization as a tool for implementing

---

[45] "Lessons from the FDA Model," *Lessons from the FDA for AI*, AI Now Institute, August 1, 2024, https://ainowinstitute.org/publication/section-3-lessons-from-the-fda-model.

[46] United Nations Human Rights, "World Stumbling Zombie-Like into a Digital Welfare Dystopia, Warns UN Human Rights Expert," press release, October 17, 2024, https://www.ohchr.org/en/press-releases/2019/10/world-stumbling-zombie-digital-welfare-dystopia-warns-un-human-rights-expert.

austerity.[47] Amnesty International,[48] Human Rights Watch,[49] Algorithm Watch,[50] and A11[51] have all documented how automating the delivery of essential public services can lead to discrimination and exclusion, while shifting the burden of proof to those who are already marginalized.

One challenge that public authorities face, as MEP Kim Van Sparrentak and Simona de Heer explain in Chapter VII, involves the limitations set by the EU Procurement Directives. Public authorities currently need to choose vendors based on the lowest price, rather than considering strategic autonomy, sustainability, social standards, privacy, or the long-term governance of the end product—criteria that are crucial to ensure that taxpayer money is being spent in ways that are best for society and the economy.

Sarah Chander and Seda Gürses highlight some of the more fundamental issues that come with the blanket adoption of AI in their chapter, *From Infrastructural Power to Redistribution*. A punitive vision of security dominates many EU investments that fuse the concept of public safety with police, borders, and the military. Pushing for the blanket adoption of AI underestimates how expanding computational infrastructure can lead to a transformation of the economy that ultimately places the economic interests of tech companies at the heart of public and private institutions.[52]

Thinking about alternatives, or even considering AI's inherent limitations, requires a shift away from weighing risks and benefits toward asking more fundamental questions about the role that AI technologies can and should play in delivering public services, or in European society more broadly.[53]

Theme: Innovation Grows with Bold Regulatory Enforcement

---

[47] European Anti-Poverty Network, An Exploratory Study on the Use of Digital Tools by People Experiencing Poverty, 2024, https://www.eapn.eu/an-exploratory-study-on-the-use-of-digital-tools-by-people-experiencing-poverty.

[48] Amnesty International, "Trapped by Automation: Poverty and Discrimination in Serbia's Welfare State," December 4, 2023, https://www.amnesty.org/en/latest/research/2023/12/trapped-by-automation-poverty-and-discrimination-in-serbias-welfare-state.

[49] Amos Toh, "Automated Neglect: How The World Bank's Push to Allocate Cash Assistance Using Algorithms Threatens Rights" Human Rights Watch, June 13, 2023, https://www.hrw.org/report/2023/06/13/automated-neglect/how-world-banks-push-allocate-cash-assistance-using-algorithms.

[50] Alina Yanchur, "'All Rise for the Honorable AI': Algorithmic Management in Polish Electronic Courts," Algorithm Watch, May 27, 2024, https://algorithmwatch.org/en/polish-electronic-courts.

[51] https://antisocijalnekarte.org/en.

[52] Agathe Balayn and Seda Gürses, "Misguided: AI Regulation Needs a Shift in Focus," *Internet Policy Review* 13, no. 3, September 30, 2024, https://policyreview.info/articles/news/misguided-ai-regulation-needs-shift/1796.

[53] AI Now Institute, "AI Now Submission to the Office and Management and Budget on AI Guidelines," December 20, 2023, https://ainowinstitute.org/publication/ai-now-submission-to-the-office-and-management-and-budget-on-ai-guidelines.

Rather than pit innovation against regulation, industrial policy investments should move in tandem with bold regulatory enforcement, with the goal of shaping innovation in the public interest.

The idea that tech regulation is merely a burden for European companies and harmful to European innovation is a long-standing argument advanced by US tech companies and their allies. This framing, which now also informs some of the thinking behind Europe's nascent industrial strategy, is based on a false distinction. There are no unregulated markets—only differently regulated markets. It is a key, and unavoidable, task of policymakers to shape the patterns of economic action. Regulation can proactively shape digital economies and ensure that companies pursue innovation that strengthens, rather than undermines, core European values such as fundamental rights.

One key way to flip the script is to underscore that the lack of effective enforcement of existing data protection and competition has contributed to the kind of market concentration we see across the AI stack and the business models that sustain this concentration. Allowing the current surveillance-based business models to proliferate has prevented alternative business models from emerging. Any diagnosis of Europe's inability to compete in this paradigm must at least partially, then, fall upon the failure to adopt a sharp enforcement posture on unchecked commercial surveillance and on the consolidation of market position across the AI stack.

This regulation-versus-innovation paradigm can also distract from the important question of what kinds of regulatory approaches and enforcement mechanisms will best be able to discipline and shape the market in the public interest. In fact, while the AI Act is routinely invoked to argue that regulation is too complex and burdensome, the AI Act is mired in loopholes and exemptions in areas concerning direct harms to human life—for instance in domains relating to police, migration control, and security actors.[54] The risk-based product safety approach that underlies the AI Act is not sufficient and sometimes even counterproductive when it comes to protecting people from fundamental rights violations and harm in many sensitive contexts. [55, 56]

---

[54] #ProtectNotSurveil, "Joint statement – A Dangerous Precedent: How the EU AI Act Fails Migrants and People on the Move," March 13, 2024, https://www.accessnow.org/press-release/joint-statement-ai-act-fails-migrants-and-people-on-the-move.
[55] European Center for Not-for-Profit Law, "ECNL, Liberties and European Civic Forum Put Forth an Analysis of the AI Act from the Rule of Law and Civic Space Perspectives," April 3, 2024, https://ecnl.org/news/packed-loopholes-why-ai-act-fails-protect-civic-space-and-rule-law.
[56] European Disability Forum, "EU's AI Act Fails to Set Gold Standard for Human Rights," April 3, 2024, https://www.edf-feph.org/publications/eus-ai-act-fails-to-set-gold-standard-for-human-rights.

Theme: Europe's Place in the World

In what is perceived as an existential race for geopolitical influence and competitiveness vis-à-vis the US and China, and amid widespread fears of Europe's subordination, Europe must not lose sight of the many ways in which its policy orientation will shape the landscape of possibility, not just for the EU but also for the rest of the world.

Digital trade policy, and in particular requirements for maintaining low trade barriers for digital goods and services, often implying minimal or no regulation or conditionalities, can significantly shape the field of possibility when it comes to industrial policy. As Burcu Kilic argues in Chapter VIII, the EU's digital trade policy has long taken a neoliberal approach; Draghi's recommendations focusing on keeping low trade barriers to ensure continued access to the latest AI models and processors in the US is no exception. Primarily benefiting Big Tech, the EU's neoliberal approach to trade has promoted tech-driven globalization while remaining largely disconnected from broader EU domestic policies and priorities (with the exception of privacy). In this paradigm, many industrial policy measures to shape the trajectory of tech development could be treated as trade barriers, preventing not just Europe, but also other regions and nations that Europe trades with, from adopting an ambitious industrial policy strategy that prioritizes people and the planet. A neoliberal trade agenda, Kilic argues, is simply incompatible with industrial policy.

In her chapter, Francesca Bria urges Europe not to be purely inward-looking in its industrial policy orientation, even if it is motivated primarily by the desire for sovereignty, pointing to the possibilities for more global alliances motivated by challenging the current concentrations of power. While "the Brussels effect,"[57] a process of unilateral regulatory globalization caused by the European Union, is ultimately unidirectional and has not always been positively received by the countries that are nudged to comply with European laws, Bria hopes that through a stronger emphasis on building alternatives, Europe can become a collaborator in sharing a fairer digital future.

Conclusion

---

[57] Anu Bradford, The Brussels Effect: How the European Union Rules the World (New York: Oxford University Press, 2020), https://doi.org/10.1093/oso/9780190088583.001.0001.

This collection features a broad spectrum of ideas for what a public-interest vision of AI beyond competitiveness and sovereignty could look like. These critical interventions provoke a rethinking of the fundamental ideas underpinning European tech and innovation policy. They offer different approaches to the values and norms that should underpin European industrial policy on AI, and the economic and societal outcomes that such interventions should ultimately seek to create.

While authors differ in their stances, backgrounds, and political positioning on these issues, they are united in showing that past tools and approaches are not fit for purpose. Neither incremental change, nor significant investments into a predefined innovation trajectory, will benefit the public interest. Instead, European tech and innovation policy needs a vision and a radical rethink.

To engage in a radical reset, Europe must grapple with no less than existential questions about the direction and nature of its digital future. Answering these questions requires abandoning comfortable, established speaking points, superficial analyses, and bland statements that stand in for a serious discussion of what technology politics could be:

- What kind of (digital) future does Europe want?
- What role can, and should, AI technologies play in this future?
- Who will have a say in determining the path?

These are the challenging questions we will start to address in this report and will continue to grapple with in the coming years.

II. Europe Needs an EC-Led AI Plan for the People and the Planet

by Assoc. Prof. Cecilia Rikap

The European Commission's proposal for boosting AI combines initiatives to promote its supply and demand.[58] "AI factories" with public supercomputers and services for training models and developing applications are expected to galvanize supply. And, for stimulating AI appetite, the EC proposes "GenAI4EU," a grouping of scattered grant schemes to expand adoption in an array of industries, science, and the public sector.

A straightforward critique would put eyes on the recommended investment: a total of €3.3 billion for the "AI Factories" and half a billion for "GenAI4EU" by 2027. Although these figures may seem astronomical, in early October 2024 Microsoft announced that it will invest $2.7 billion in Brazil alone between 2024 and 2027 for cloud and AI infrastructure, and $4.7 billion in Italy over the next two years.[59] And in 2023, two-thirds of the $27 billion invested in generative AI startups came from this giant, Amazon, and Google.[60]

A relatively meager investment is, however, the least of the EC's problems. While its proposal aims to create a competitive EU market for AI, it ignores that the AI global value chain is not a market but a planned sphere. Unlike old monopolies, Big Tech controls beyond ownership, using its concentrated data, AI talent, and digital infrastructure to plan the whole chain, dictating how and what AI models and applications are developed.[61] They do so acting as corporate venture capitalists, dominating the global AI knowledge and innovation network and ruling from their clouds.[62] These are not just "factories," but

[58] European Commission, "Communication on Boosting Startups and Innovation in Trustworthy Artificial Intelligence," Policy and Legislation, January 24, 2024, https://digital-strategy.ec.europa.eu/en/library/communication-boosting-startups-and-innovation-trustworthy-artificial-intelligence.

[59] "Microsoft Invests €4.3B to Boost AI Infrastructure and Cloud Capacity in Italy," press release, Microsoft, October 2, 2024, https://news.microsoft.com/pt-br/microsoft-announces-14-7-billion-reais-investment-over-three-years-in-cloud-and-ai-infrastructure-and-provide-ai-training-at-scale-to-upskill-5-million-people-in-brazil.

[60] George Hammond, "Big Tech Outspends Venture Capital Firms in AI Investment Frenzy," *Financial Times*, December 29, 2023, https://www.ft.com/content/c6b47d24-b435-4f41-b197-2d826cce9532.

[61] Cecilia Rikap, "Dynamics of Corporate Governance Beyond Ownership in AI," Common Wealth, May 15, 2024, https://www.common-wealth.org/publications/dynamics-of-corporate-governance-beyond-ownership-in-ai.

[62] Cecilia Rikap, "Varieties of Corporate Innovation Systems and Their Interplay with Global and National Systems: Amazon, Facebook, Google and Microsoft's Strategies to Produce and Appropriate Artificial Intelligence," *Review of International Political Economy* (June 2024): 1–29, https://doi.org/10.1080/09692290.2024.2365757.

planned spheres with rules clearly set by Big Tech. As thousands of organizations coproduce AI in these spaces, the three giants profit disproportionately.

Recipes that Reinforce the Status Quo

The EC's industrial policy and pro-competition playbooks will backfire. As odd as it may seem, cloud giants embrace competition and innovation in the AI value chain. AI's pattern of innovation is characterized by an entrenched and established core of Big Tech surrounded by a turbulent periphery.[63] A flourishing startup community expands the periphery of companies producing parts of the chain. And as competition—turbulence—increases, whether for AI modeling or in any AI application field, the better it will be for Big Tech. Not even a promising startup like OpenAI will dream of debunking the giants, since it will have to focus on systematically winning the innovation race in its gear of the chain. Meanwhile, only Big Tech produces AI autonomously, retaining a panopticon view and value-chain bottlenecks.

While European startups may train their models on EU supercomputers, they will in any event be pushed to sell where demand goes, thus on Big Tech clouds. On top of offering infrastructure as a service, their clouds are supermarkets of computing services that spare small companies from having to develop every single line of code for each solution. Even Meta, which trains its models in-house, offers them as a service on Amazon, Microsoft, and Google clouds.

GenAI4EU is made of Horizon Europe calls and public-private partnerships. It is highly unlikely that these instruments will divert demand from the cloud. Big Tech has armies of outsourced companies and has developed dozens of strategic partnerships. Google has a list of eighty strategic partners in Europe, mostly leading corporations like LVMH[64] and Renault,[65] which then hire startups for specific solutions. I would pay to see all these European companies breaking existing agreements for a Horizon grant.

[63] Cecilia Rikap, "Intellectual Monopolies as a New Pattern of Innovation and Technological Regime," *Industrial and Corporate Change* 33, no. 5 (October 2024): 1037–1062, https://doi.org/10.1093/icc/dtad077.

[64] "LVMH and Google Cloud Create Strategic Partnership for AI and Cloud-Based Innovation," Google Cloud, press release, PR Newswire, June 16, 2021, https://www.prnewswire.com/news-releases/lvmh-and-google-cloud-create-strategic-partnership-for-ai-and-cloud-based-innovation-301313307.html.

[65] "Renault Group and Google Accelerate Partnership to Develop the Vehicle of Tomorrow and Strengthen Renault Group's Digital Transformation," Renault, press release, November 8, 2022, https://media.renaultgroup.com/renault-group-and-google-accelerate-partnership-to-develop-the-vehicle-of-tomorrow-and-strengthen-renault-groups-digital-transformation.

Another area of concern picked up by the EC proposal is Europe's scant public and private funding for AI startups and scale-ups, which either fail, or—like the French Mistral AI—end up partially funded by Big Tech.[66] But things are even more complicated because European corporations support US startups. By February 2024, 59 percent of the companies receiving SAP's venture capital were based in the US and only 11 percent were German. It is unclear how investors will prioritize European companies. Anyway, without breaking up their relationship with Big Tech, pouring more public or private money into European startups will—for the reasons I have explained above—end up favoring the cloud hegemons.

Both in terms of digital infrastructure and investment, the EC does a good job identifying Big Tech as the problem, but fails to fully understand the complexity of Big Tech's AI stranglehold. Something similar happens with talent, which is seen by the EC as crucial for developing independent AI. However, the EC's proposal to expand talent is shortsighted. It suggests more collaboration with European startups and universities, while neglecting that the most talented AI scientists and engineers work either for Big Tech or for their satellite startups. These people will not massively leave their jobs to apply for an ERC or Marie Skłodowska-Curie grant. What is worse, the talent that has remained in academia, in Europe and elsewhere, either works part-time for Big Tech[67] or is funded by Big Tech. Working closer with such academics means working with (for) Amazon, Microsoft, and Google.

In short and inadvertently, the EC proposal is a one-way ticket to play Big Tech's game, favoring the companies that it accurately aims to keep at bay.

Reimagining Sovereignty in the AI Age

Considering the scale and centrality of Big Tech's monopolized positions in data, talent, and the cloud, some might call for a European champion. Besides being unrealistic, the problem is not these giants' nationality but the fact that Big Tech companies are

---

[66] Rikap, "Dynamics of Corporate Governance Beyond Ownership in AI."
[67] Rikap, "Varieties of Corporate Innovation Systems and Their Interplay with Global and National Systems."

intellectual monopolies;[68] they appropriate value by capturing knowledge and data coproduced with or simply produced by many others. Neither can solutions spring from promoting competitive markets in the void. Parts of the AI value chain require scale and are too sensitive to be left in private hands. Private accumulation is companies' DNA; thus nothing assures that we will get the AI that society and the planet need if AI is left in private hands.

Instead of—unsuccessfully—chasing US and Chinese Big Tech by creating a European AI market or champion, the EC should show that another AI is possible and desirable. Given AI's centrality, associated risks, and tendency toward monopolization, the only way to do this is by democratically planning its development and use. But this is the main weakness of the EC proposal: its complete lack of desire to plan—to steer, coordinate, and shape—what AI is produced, why it is produced, and who it is produced by.

An EU-led AI plan should comprise a truly public cloud that is not only a factory but also a space where AI and other computing solutions can be accessed. And, along the lines of Brazil's AI plan,[69] it should also include foundational AI models governed as a commons and a strategy to bring talent back. The plan and its associated public technology—the cloud and foundational models—should remain under the oversight of a new European institution independent of corporations and individual governments. This institution should safeguard human and civil rights and assess AI development and use against energy and water consumption.[70] It should also take the bold step of recognizing that an AI plan that puts the people, the planet, and democracy first requires that economic gains and efficiencies take a back seat. Only then will such a plan be a steward of the sovereignty of states and peoples in the digital age.

[68] Cecilia Rikap, *Capitalism, Power and Innovation: Intellectual Monopoly Capitalism Uncovered* (Abingdon, UK: Routledge, 2021), https://www.routledge.com/Capitalism-Power-and-Innovation-Intellectual-Monopoly-Capitalism-Uncovered/Rikap/p/book/9780367750299.
[69] "Brasil Launches a USD 4 billion Plan for AI and Prepares Global Action," G20 Brasil 2024, July 30, 2024, https://www.g20.org/en/news/brasil-launches-a-usd-4-billion-plan-for-ai-and-prepares-global-action.
[70] *2024 Digital Economy Report: Shaping an Environmentally Sustainable and Inclusive Digital Future*, United Nations Conference on Trade and Development, 2024, https://unctad.org/publication/digital-economy-report-2024.

III. Aggressively Weaponizing Scaled Assets to Lock In Absolute Advantage

By Hon. Prof. Cristina Caffarra

FTC Commissioner Rebecca Slaughter likes to say that "doing something is a policy choice, doing nothing is also a policy choice."[71] The current AI arms race perfectly encapsulates this predicament for antitrust regulators. Enforcers have expressed frustration and collective guilt that what they have done to contain the growth of Big Tech has been too little, too late. Some fear that what we see unfolding before our eyes in AI is a disaster foretold, with Big Tech grandfathering its grotesque market power into any new paradigm that might emerge around AI.

Whether AI will beget an unprecedented technological revolution, as some foresee, or will turn out to be a hype cycle, as many believe, Big Tech is making sure it uses every one of its massive scale advantages in the relevant assets (chips, compute, data, money) to own that future. There can be little doubt that *if* AI turns out to be successful and a "game changer," we will find ourselves in the hands of the very companies we are currently pursuing through desperate *post hoc* antitrust and regulation—far too late—for having built extractive and exploitative ecosystems through serial acquisitions and "agreements," as well as a cumulation of self-preferencing, tying, bundling, integration, exclusivity, and more. It's plain to see: the scale of the investment and effort, the speed at which data centers and cloud assets are being rolled out, dwarfs anything else anyone can hope to achieve.

This is not a Luddist posture. Serious research indicates that scale is a misplaced obsession that is not technically justified, and ultimately only serves to preserve the

---

[71] "Nothing about pervasive data collection and tracking the shape of social media, or the dominance of a few tech firms, was inevitable," Slaughter said at the 2024 FTC Tech Summit. "Inaction in the face of those developments was a policy choice. We have the knowledge and experience now to see this era play out differently." See Federal Trade Commission, FTC Tech Summit, Vimeo, January 25, 2024, https://vimeo.com/907483555.

primacy of the same hyperscalers that dominate the digital space today.[72] We are seeing market power being inexorably protected and projected into the future.

And yet, as we watch massive scale advantage being put in place and cemented, regulators in Europe are not taking a stand. The market-power playbook is unfolding before our eyes, but all we hear from regulators is "we are monitoring" and "we are carefully studying" the issue. Worse, questions are being asked and "agreements" ostensibly "investigated," but so far the response has been, "There's nothing to see here—case closed."

The Great Legal Workaround

Regulators' heightened focus on Big Tech acquisitions over the past five years, together with the rise of "killer acquisition" concerns, sensitized Big Tech to the perils and delays of merger review.[73] Acquiring assets in the usual way implies too much perceived regulatory risk. Yet obtaining external assets ("buy versus build") remains the norm in tech: ecosystems have been built largely by buying (without scrutiny) a number of willing complements, with founders all too happy to go to the beach on a large send-off. This is conventionally portrayed as benign, providing founders with a "natural exit route" which not only puts hundreds of millions in their pocket but is an essential "incentive to innovation." The motives can be much darker. But whether the objective is to buy up talent and assets it would take too long to develop organically, or to snuff out something perceived as a potential competitor along the way, acquisitions are central to how tech operates.[74]

The heightened regulatory risk means we are seeing multiple examples of "clever lawyering" that exploit opportunities to present a tie-up in ways that cannot be formally caught by merger rules. Clever lawyering can include exploiting time bars, for instance;[75] or appearing to make a purely financial investment; or taking no shares in the company but only title to a share of profit distribution; or hiring the team rather than acquiring the

[72] Gaël Varoquaux, Alexandra Sasha Luccioni, and Meredith Whittaker, "Hype, Sustainability, and the Price of the Bigger-Is-Better Paradigm in AI," arXiv:2409.14160v1 [cs.CY], September 21, 2024, https://arxiv.org/pdf/2409.14160.

[73] Microsoft/Activision took two years to get through in Europe, with enormous lobbying effort; Facebook/Giphy was blocked; Amazon/iRobot was abandoned; Adobe/Figma, too; Booking/eTraveli was blocked.

[74] Gregory Crawford, Tommaso Valletti, and Cristina Caffarra, "'How Tech Rolls': Potential Competition and 'Reverse' Killer Acquisitions," CEPR, May 11, 2020, https://cepr.org/voxeu/blogs-and-reviews/how-tech-rolls-potential-competition-and-reverse-killer-acquisitions.

[75] The Microsoft/OpenAI defense in a nutshell: "You already found we had material influence when we made an initial investment in this company x years ago; now the new (much larger) investment changes nothing in terms of control, so you cannot touch us."

company, essentially spoliating the asset and leaving a shell behind. Because the law sets out specific requirements for any transaction to create "a relevant merger situation,"[76] companies have enormous leeway to build constructs that are technically within the confines of the law—being careful not to appear to create control structures—and yet just cannot be competitively neutral. In exchange for stacks of money and cheap "compute," for example, the company gets advance notice of new features and products. This is an advantage. But if the conditions are not met—if assets do not cease to be distinct, or if one party is short of the required turnover thresholds—then regulators will throw up their hands and say, "There's nothing to see here."

This happened recently with Amazon/Anthropic and Microsoft/Mistral in the UK. The Amazon/Anthropic decision[77] issued by the Competition and Markets Authority (CMA) in September 2024 concluded that it "did not need to reach a conclusion" on whether the arrangement conferred Amazon "material influence" on Anthropic, simply because the basic threshold for merger control intervention in the UK was not met.[78] In the Microsoft/Mistral decision, the CMA said it "did not believe the parties ceased to be distinct."[79] Amen. The agency simply threw in the towel.

The Persistence of Old Norms

What's worse is that *even if by some miracle the agency decides there is something to investigate,* then cases all fall at the next hurdle: What is the "merger theory of harm" that can identify an issue? In conventional antitrust analysis, mergers and agreements can be problematic if they create a significant share in a well-defined relevant market, such that it can be inferred that market power will be exercised thereafter. This is frankly hopeless. These are merger rules created for an analog world where forward-looking issues about creating the condition for exploiting market power later are just barely catered to. This has of course been the kiss of death for inquiries into past digital cases (from

---

[76] In the UK, for instance, it must be the case that "the assets cease to be distinct," and the parties must be above a particular share of a well-defined "market," or share of "supply."

[77] Amazon funded Anthropic to the tune of $4 billion overall between 2023 and 2024, plus computing capacity. See Competition and Markets Authority, "Amazon.com Inc.'s Partnership with Anthropic PBC: Decision on Relevant Merger Situation," September 27, 2024, https://assets.publishing.service.gov.uk/media/66f680eec71e42688b65eda0/Summary_of_phase_1_decision.pdf.

[78] "In particular, the CMA found that Anthropic's UK turnover does not exceed £70 million in the UK, nor do the Parties, on the basis of the available evidence, together account for a 25% or more share of supply of any description of goods or services in the UK." Competition and Markets Authority, "Amazon.com Inc.'s Partnership with Anthropic PBC: Found Not to Qualify Decision," September 27, 2024, https://www.gov.uk/cma-cases/amazon-slash-anthropic-partnership-merger-inquiry#found-not-to-qualify-decision.

[79] Competition and Markets Authority, "Microsoft Corporation's partnership with Mistral AI: Decision on Relevant Merger Situation," May 17, 2024, https://assets.publishing.service.gov.uk/media/664c6cfd993111924d9d389f/Full_text_decision.pdf

Facebook/Instagram to Facebook/WhatsApp), where targets were incipient or monetization did not take place in the conventional way through a well-defined "price."

The Microsoft/Inflection[80] example is telling. Having initially decided it would invite Member States to refer the case to it, DG Competition ended the probe in September 2024 in the wake of its court defeat in the challenge to Illumina/GRAIL. Most significantly, the decision on the same case by the CMA makes especially sad reading. Having eventually decided that hiring key personnel and staff from a company while paying off the funders *is* potentially akin to an acquisition of the asset (what else could it be), the case was closed on the grounds that in a "relevant market" for the "development and supply of consumer chatbots globally" and the "development and supply of foundation models globally," there would not be material "loss of competition."[81]

The problem with all of this is that it predictably goes nowhere. Of course a static estimate of "market shares" as a snapshot today will not generate high enough numbers. Of course looking at revenues and any other conceivable measure of *output* today is not going to provide any measure of market power. What matters is the control of *key inputs,* and conventional antitrust analysis that focuses on present outturns goes perfectly nowhere. Regulators need a bold and imaginative posture.

What Theory of Harm?

Antitrust agencies should call it like it is: Big Tech players controlling a set of very large assets (chips, compute, data) are doing deals to combine these key *inputs* with machine learning in order to move ahead fast and preemptively "occupy" the terrain. This is not entirely new or specific to AI: the extension of market power by leveraging complementary relevant assets has in fact been Big Tech's playbook for years—swinging capabilities into new spaces to gain first-mover advantage, preempt competition, and suffocate challenges. Antitrust economists have traditionally argued that we need an economic model to "prove" a narrow specific "mechanism" through which market power gets

---

[80] Microsoft paid $650 million to Inflection to hire key personnel, including two cofounders, in March 2024. Having previously raised $1.3 billion just a few months earlier, including from Microsoft, this was a significant climbdown.
[81] Competition and Markets Authority, "Microsoft Corporation's Hiring of Certain Former Employees of Inflection and Its Entry into Associated Arrangements with Inflection," September 4, 2024, https://assets.publishing.service.gov.uk/media/66d82eaf7a73423428aa2efe/Summary_of_phase_1_decision.pdf.

"leveraged" from one place to another; or that "this cannot be bad, in fact it is beneficial, it is efficient to be able to combine complementary assets and develop new services".

The key is that these ecosystems can marshal their giant assets (including ill-gotten ones, like our data) in unprecedented ways to extend their existing massive power into new applications, preempting others. *This very pooling and deploying these inputs aggressively to occupy new spaces ahead of others should be the antitrust theory of harm.* Is this exceptionalism? Perhaps, but Big Tech does deserve differential treatment given its past form. And this is absolutely the way to understand what is going on. In "Antitrust Policy and Artificial Intelligence," Cecilia Rikap also similarly refers to "an ensemble of mechanisms [enabling] cloud hegemons (Microsoft, Google, Amazon) to plan the whole AI knowledge and innovation network by weaponizing interdependence in networks."[82] The idea of "weaponizing" assets is particularly apt, as "cloud/AI hegemons are focused on ensuring that emerging companies build their architecture and run fully on their clouds", which "provides a vehicle to affect their architecture decisions and sterilizes their role as real challengers."

Regulators faced with these workarounds should not throw up their hands but should instead go boldly forward, arguing "weaponization of scaled complements," which is the essence of the concern: a small group of hyperscalers and Big Tech firms aggressively using their large-scale assets in ways no one else can, to project their existing power into the future. This has both exclusionary and exploitative connotations in that it forecloses opportunities for alternative states of the world, secures extraction of future rents by today's giants, and determines the direction of innovation. A coherent case can be articulated along these lines. It won't please antitrust traditionalists, but it does precisely capture the reality on the ground. We need ongoing policy R&D with theories of harm shaped to map into the real world—not a persistent, self-defeating, cookie-cutter application of obsolete rules.

---

[82] Cecilia Rikap, "Antitrust Policy and Artificial Intelligence: Some Neglected Issues," Institute for New Economic Thinking, June 10, 2024, https://www.ineteconomics.org/perspectives/blog/antitrust-policy-and-artificial-intelligence-some-neglected-issues. See also Henry Farrell and Abraham L. Newman, "Weaponized Interdependence: How Global Economic Networks Shape State Coercion," *International Security* 44, no. 1 (July 2019): 42–79.

IV. Predatory Delay and Other Myths of "Sustainable AI"

by Dr. Fieke Jansen and Michelle Thorne

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.[83]

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,"[84] where tech giants are championed as accelerators of decarbonization and poised to further consolidate their market power as the vendors of sustainability solutions.[85]

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.

Myths of AI and Sustainability

---

[83] 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.

[84] 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.

[85] 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.[86] However, one should be wary of the rhetorical tactics used to defer meaningful climate action, known as discourses of delay.[87] 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,[88] 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.[89] Meanwhile, large AI providers underreport data center emissions by 660 percent, according to a recent investigation by the *Guardian*.[90]

In some European countries such as Ireland, data centers already use a fifth of the countries' total electricity consumption.[91]

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.[92] It's estimated that ca. 500 ml of water is consumed for every 10–50

---

86 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.

87 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.

88 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.

89 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.

90 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.

91 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.

92 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.[93] 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.[94]

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.[95] 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.[96,97,98,99] These negative health and environmental impacts are experienced disproportionately by communities in the Majority World, continuing the practice of environmental colonialism.[100]

2. AI Will Speed Up the Transition

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

---

[93] Ibid.

[94] 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.

[95] 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.

[96] Sofia Benqassem, Frederic Bordage, Lorraine de Montenay, Julie Delmas-Orgelet, Firmin Domon, 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.

[97] Stephani S. Kima, Xijin Xub, Yuling Zhangb, Xiangbin Zhengb, Rongju Liub, Kim N. Dietricha, Tiina Reponena, Changchun Xiea, Heidi Sucharewc, 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.

[98] 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.

[99] 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.

[100] 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.

[101] Adoption of the Paris Agreement, United Nations, 2015, 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.[102] 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,[103] shortening the lives of people living near the power plants and further locking society into an unhealthy fossil future.[104]

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,[105] 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."[106] 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.[107]

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".[108] For example, in agriculture, AI is argued to be

---

[102] 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.

[103] 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.

[104] 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.

[105] 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.

[106] "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.

[107] Karen Hao, "Microsoft's Hypocrisy on AI," *Atlantic*, September 13, 2024, https://www.theatlantic.com/technology/archive/2024/09/microsoft-ai-oil-contracts/679804.

[108] 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.[109]

Reframing Innovation and Industrial Policy: Toward Regenerativity

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.[110]

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

[109] 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.

110 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.

V. From Infrastructural Power to Redistribution: How the EU's Digital Agenda Cements Securitization and Computational Infrastructures (and How We Build Otherwise)

By Sarah Chander and Assoc. Prof. Seda Gürses

In 2024, the European Union sits at the axis of vast power shifts: rising far-right influence, discontent on issues of security and migration, and increasing power of large technology companies in the US and China. In this context, the EU's digitalization agenda feeds into two central trends in EU policy that are rarely discussed together in tech policy circles. The first trend is a commitment to European securitization[111] bolstered through digital projects in the service of the military, law enforcement, and migration control. And the second is an emerging industrial policy—that securitizes European markets—with major bets on digitalization and scaling-up of tech companies for improving European competitiveness in markets and geopolitics.

Together, these two approaches are features of broader efforts to ensure the "strategic autonomy"[112] of Europe—an alarmist, populist expression of a post-neoliberal strategy that constructs Europe's loss of competitiveness as a security threat, justifying the pouring of EU public funds into markets.[113] We discuss how these two trends combined increase investment into market players that produce digital services. These fundamentally

---

[111] *Securitization* is defined by Buzan, De Wilde, and Waever as a situation where an actor '(manages) to break free of procedures or rules he or she would otherwise be bound by', through the use of 'an argument about the priority and urgency of an existential threat'. In Buzan, Barry, Ole Wæver, and Jaap De Wilde. *Security: A new framework for analysis*. Lynne Rienner Publishers, 1998.

[112] European Commission, *The Future of European Competitiveness*, September 2024, https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4c-f152a8232961_en?filename=The%20future%20of%20European%20competitiveness%20_%20A%20competitiveness%20strategy%20for%20Europe.pdf.

[113] Salih Işık Bora, "Neoliberal Means to Dirigiste Ends: Explaining the French Government's Use of Heroic Industrial Policy Discourse (HIPD) in EU Politics," *French Politics*, October 4, 2024, https://doi.org/10.1057/s41253-024-00263-2. In an aligned take on the impact of EU industrial policy, Angela Wigger concludes: "Alongside ascending fractions of industrial capital in technology-intensive value chains, financial capital is not only a key beneficiary but also enjoys a powerful position: It can make a profit from the loans or equity investments without having to carry all the risks, while (organised) labour, and society at large, has no participatory role in the decision-making about the reinvestment of accrued profits." See Angela Wigger, "The New EU Industrial Policy: Opening Up New Frontiers for Financial Capital," *Politics and Governance* 12, no. 8192 (2024), https://doi.org/10.17645/pag.8192. Going forward, we propose combining Bora's and Wigger's powerful analyses with the one provided in our article, which unpacks the role of digitalization.

transform the institutions necessary for democracy while, paradoxically, cementing the infrastructural power of a handful of US technology companies. We then ask what demands can be put to the EU to counter these developments.

Digitalizing the EU's Securitization Project

With the EU's securitizing framework, security threats are instrumentalized to mobilize resources, legislation, and narratives in pursuit of a militaristic, punitive, and surveillance-based vision of "security." EU institutions fuse the concept of public safety with police, borders, and the military. Vast political resources are expended to justify this, feeding a cycle in which security logics permeate many strands of public policy. The EU's digitalization agenda is no exception: from the allocation of resources to the increased role of digital technologies in legislation, a punitive vision of security dominates.

Securitization of digitalization (henceforth referred to as *digital securitization*) expands the legal basis for technological infrastructures to further surveillance and criminalization. In the last EU mandate we saw a proliferation of legislation, including the EU Migration Pact, endorsing and expanding the surveillance and criminalization of migrants.[114] The Pact takes numerous steps to ramp up the digital systems used to prevent and control migration, to manage asylum processing and detention centers, and to expand an already broad regime for the monitoring of migrants.

A central legislative example of digital securitization can be found in the Artificial Intelligence Act.[115] Presented with the opportunity to limit the use of AI to perform mass surveillance and discriminatory targeting, EU legislators wholeheartedly failed to include necessary safeguards in the areas of security, policing and migration control.[116] They stopped short of prohibiting the worst forms of predictive policing, biometric surveillance, and harmful uses of AI in the migration context. The AI Act made police, migration control, and security actors exempt from the public transparency and accountability requirements imposed on "high-risk" AI, solidifying the existing state of opacity in which state actors use technologies to monitor, sort, and punish people.

---

[114] #ProtectNotSurveil, "The EU Migration Pact: A Dangerous Regime of Migrant Surveillance," April 2024,
https://www.equinox-eu.com/wp-content/uploads/2024/04/The-Migration-Pact-ProtectNotSurveil.pdf.
[115] European Union, Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024, Official Journal of the European Union, June 2024, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32024R1689.
[116] #ProtectNotSurveil, "Joint statement – A Dangerous Precedent: How the EU AI Act Fails Migrants and People on the Move," March 13, 2024,
https://www.accessnow.org/press-release/joint-statement-ai-act-fails-migrants-and-people-on-the-move.

EU securitization also confirms member-state initiatives to expand the digital infrastructures that surveil marginalized communities, including migrants, sex workers, and queer, working class, and racialized groups. We see increased recourse to technologies that target these communities, such as the "preventative identification" policing systems in the Netherlands;[117] and widening narratives that justify surveillance as part of punitive solutions for the "protection" of marginalized communities, such as in anti-smuggling legislation. By increasing the scope and legal legitimacy of surveillance frameworks, the EU participates in a broader logic of racialized suspicion,[118] punishment, and state violence as a "solution" to issues of public safety and social inequality.

Securitization also entails vast investments into the digital. The EU is increasingly funding security infrastructures and agencies such as Europol. Much of this investment is outsourced via contracts to private companies; as reported by Statewatch, Frontex's 2023 procurement plan included €260 million for IT systems, and a further €180 million for border-surveillance equipment to increase deportations.[119]

Part and parcel of EU's digital securitization is therefore the encroachment of the private sector (including technology and military companies) into state functions, integrating profit motives into home affairs and migration policy. This will only increase as the EU pushes through with its industrial agenda, aspiring to scale European defense industries (including surveillance systems), for example, through collaborative procurement.[120] The question is: With what consequences?

Cementing Infrastructural Power of Tech Companies

Much of the EU's digital industrial strategy is based on a superficial understanding of digital infrastructures as "compute" or "the internet," and the assumption that AI will improve productivity across all sectors. This framing takes a product-oriented view on technology, i.e., cloud and AI products, ignoring the transformational role tech companies

---

[117] Fieke Jansen, *Top400: A Top-Down Crime Prevention Strategy in Amsterdam*, Racism & Technology Center, November 2022, https://racismandtechnology.center/wp-content/uploads/20221101-data-justice-lab-top400-report.pdf.
[118] Maham Hashmi and Sarah Chander, *Ending Fortress Europe: Recommendations for a Racial Justice Approach to EU Migration Policy*, Equinox Initiative for Racial Justice, June 2022, https://www.equinox-eu.com/wp-content/uploads/2022/06/Ending-Fortress-Europe.pdf.
[119] "Frontex to Spend Hundreds of Millions of Euros on Surveillance and Deportations," Statewatch, April 24, 2023, https://www.statewatch.org/news/2023/april/frontex-to-spend-hundreds-of-millions-of-euros-on-surveillance-and-deportations.
[120] European Commission, "Address by Mr. Draghi – Presentation of the Report on the Future of European Competitiveness," European Parliament, September 17, 2024, https://commission.europa.eu/document/download/fcbc7ada-213b-4679-83f7-69a4c2127a25_en.

are increasingly playing in economic production. It mistakenly assumes that the introduction of digital products can only have a productive effect on public and private organizations, leaving their institutional power intact.

A richer understanding could be sketched as follows: computational infrastructures, i.e., cloud plus end devices, are not products but *production environments* for digital services.[121] By now concentrated in the hands of a few companies like Microsoft, Amazon, Google, and Apple, these production environments are used not only for producing information services, but also for economic production more generally, e.g., for the manufacturing of cars[122] or for public transportation services.[123] The economic promise of computational infrastructures is therefore not the accumulation of subscription fees (a form of rent collected by infrastructural landlords), but the transformation of organizations technically and financially toward a model of production native to these production environments. A car company, for example, can come to look more and more like a digital services company, increasingly running its production of cars using machinery—both now considered end devices—tightly bound to the cloud. The catch is in how this model of production is organized: it means that service providers[124] can insert themselves into the operations and financials of organizations, whether car manufacturers or public transportation providers. Once zipped into the internals of an organization, these service providers enter a long-term relationship that enables them to optimize operations of companies in the image of their own economic interests. In the process, the same service providers normalize computational infrastructures, cloud plus end devices concentrated in the hands of a few companies, as production environments for ever more organizations across the globe.

This framing raises some hard questions about the consequences of such a transformation through which the economic interests of tech companies sit at the gut of the operations of public and private organizations alike.[125] (It also casts doubt on an industrial strategy blind to the underlying transformation of production it aims to make competitive.

[121] Agathe Balayn and Seda Gürses, "Misguided: AI Regulation Needs a Shift in Focus," *Internet Policy Review* 13, no. 3, September 30, 2024, https://policyreview.info/articles/news/misguided-ai-regulation-needs-shift/1796.
[122] "Major Car Manufacturer Migrates Production Floor to the Cloud," GFT, accessed October 8, 2024, https://www.gft.com/vn/en/industries/success-stories/major-car-manufacturer-migrates-production-floor-to-the-cloud.
[123] Wikipedia, "Mobility as a Service," accessed October 8, 2024, https://en.wikipedia.org/wiki/Mobility_as_a_service.
[124] Shimpi Das, "Top 7 Cloud Manufacturing Platforms in 2023," Fogwing, January 10, 2023, https://www.fogwing.io/blog/top-7-cloud-manufacturing-platforms-in-2023.
[125] Balayn and Gürses, "Misguided."

From Infrastructural Power to Redistribution

These are some of the underexplored and transformational features of the EU's two securitization agendas, clearly featured together in the EU's industrial policy aspirations.[126] Both trends, fueled by "European strategic autonomy" narratives, serve a parallel process that, even if successful, includes (a) the normalization of surveillant, punitive, or extractive technological infrastructures as policy solutions; (b) shifting public budgets away from democratic methods of social provision and toward marketized technological infrastructures; and (c) a push toward fundamental transformations of the political and economic makeup of public and private institutions. This envisions a nexus of state, institutional, and corporate actors that increasingly shape governance through technological means, a vision likely to exacerbate power imbalances through computational infrastructures.

How can technology activism meaningfully challenge these paradigms? Beyond the dominant policy responses (data protection, competition law) that often bypass racialized surveillance, distribution, extraction, and exploitation, we must ask: Why are ever-expanding resources invested in securitization if we know it does not make us safer? Why should more resources be poured into tech when the pursuit of innovation requires more of the current computational infrastructures?[127] What values would guide an *alternative transformation of production* that serves the urgencies of climate change, as well as social and economic disparities that punitive approaches only exacerbate?

Technology policy needs a vast financial, political, and ideological shift. It needs to move away from punitive, extractivist technological infrastructures and toward technologies and public policies that prioritize the needs of people, communities, and their environments—technologies and policies rooted in decriminalization, justice, and, ultimately, redistribution.

---

[126] European Commission, The Future of European Competitiveness, September 2024, https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4c-f152a8232961_en.

[127] See Ursula von der Leyen, *Europe's Choice: Political Guidelines for the Next European Commission 2024–2029*, European Union, July 18, 2024, https://commission.europa.eu/document/download/e6cd4328-673c-4e7a-8683-f63ffb2cf648_en.

VI. Lessons from the EU Chips Act on Public-Interest Guarantees

by Margarida Silva and Dr. Jeroen Merk

As the EU embraces industrial policy, it has spent little to no attention on how to guarantee that public money and resources actually serve the public interest. The EU would be well-advised to look back on previous industrial policy initiatives, such as the EU Chips Act, and learn from its mistakes.

The EU Chips Act, the Biggest Digital Industrial Policy So Far Dominated by Intel

The current proposals will not be the EU's first foray into industrial policy. Following the shocks that the COVID-19 pandemic sent through the supply chain, increased geopolitical tensions, and in response to aggressive industrial policy from the Biden administration, the EU quickly prepared a set of acts meant to support the domestic market. The EU Chips Act was one of them.

Its stated objectives were to guarantee the EU's competitiveness and resilience in the semiconductor market. It was the EU's rushed move to join the global chips subsidies war[128] by directly funding innovative semiconductor products and creating a framework to facilitate public and private investment in semiconductor production in Europe. The Act's ambitious aim was to mobilize €43 billion euros to be matched by private investment, in an effort to increase the EU's global market share in chips to 20 percent by 2030.

It is largely expected to fail.

By far, the biggest supported investor is set to be Intel, the US company that, in spite of a declining share, still dominates the market for central processing units.[129] In 2023, Intel

---

[128] Mackenzie Hawkins, Ian King, Jillian Deutsch, Yoshiaki Nohara, and Yuan Gao, "Global Chips Battle Intensifies With $81 Billion Subsidy Surge," Bloomberg, May 12, 2024, https://www.bloomberg.com/news/features/2024-05-12/chip-technology-spending-gets-81-billion-boost-in-china-rivalry.
[129] "AMD vs Intel Market Share," PassMark Software, accessed and last updated October 10, 2024, https://www.cpubenchmark.net/market_share.html.

announced[130] it had signed a €30 billion investment agreement with Germany after strong-arming[131] the government to increase the value of public subsidies to €10 billion. This was to be complemented by another investment in Poland, supported by the Polish government with €1.7 billion.[132] The Polish project was approved by the EU Commission on September 13, 2024. Four days later, Intel announced it was pausing all investments in Europe.[133]

The move was not unexpected; the company had been struggling with declining profitability for years and has largely fallen behind in the AI chips race.[134] It had turned to public subsidies to plug the gap, but even that did not suffice.

Whether the Chips Act's market-share goal is achieved or not is merely a symptom of a wider problem. It lacks a well-defined vision for how to reshape the EU's semiconductor industry.[135] It also fails to impose social, environmental, or redistributive conditions on the public subsidies granted to ensure they meet broader public goals.

This likely reflects the policymaking process. According to lobby-meeting data, high-level EU Commission officials had no discussions about the plans with trade unions, environmental organizations, or any other civil society organizations. Intel had twenty such discussions, or about 15 percent of all meetings.

Transparency is the Minimum Requirement

The public has been excluded not only from the negotiations, but also from the ability to scrutinize the resulting agreements.

Take Germany's deal with Intel. Responding to SOMO's freedom of information request,[136] the German government refused to disclose what—if any—conditions and criteria were attached to the €10 billion subsidies. It argued that to do so would threaten the country's relationship with the United States by causing a "loss of trust" from the US-based Intel.

---

[130] "Intel, German Government Agree on Increased Scope for Wafer Fabrication Site in Magdeburg," Intel, press release, June 19, 2023, https://www.intel.com/content/www/us/en/newsroom/news/intel-german-government-agree-magdeburg.html.

[131] Hans von der Burchard and Pieter Haeck, "Scholz Bags €30 Billion Intel Deal in Exchange for More Subsidies," *Politico*, June 19, 2023, https://www.politico.eu/article/olaf-scholz-wants-germany-to-become-major-chips-producer-warns-china-over-taiwan-intel-deal.

[132] "Poland Gets Green Light from EU for Intel Chip Plant," Notes from Poland, September 13, 2024, https://notesfrompoland.com/2024/09/13/poland-gets-green-light-from-eu-for-intel-factory.

[133] "A message from Intel CEO Pat Gelsinger to Employees Regarding the Next Phase of Intel's Transformation," Intel, press release, September 16, 2024, https://www.intc.com/news-events/press-releases/detail/1710/a-message-from-intel-ceo-pat-gelsinger-to-employees.

[134] Adam Tooze, "Chartbook 306 Nodes, Rebar and Private Equity: How Intel, the Weak Link in the Chip Strategy of Bidenomics, Is Resorting to Financial Engineering to Raise Billions for Fabs," Chartbook, August 7, 2024, https://adamtooze.substack.com/p/chartbook-306-nodes-rebar-and-private.

[135] Jan-Peter Kleinhans, *The Missing Strategy in Europe's Chip Ambitions*, Interface, July 30, 2024, https://www.interface-eu.org/publications/europe-semiconductor-strategy.

[136] "Intel-Investitionsmemorandum," FragDenStaat, April 19, 2024, https://fragdenstaat.de/anfrage/intel-investitionsmemorandum.

Plus, according to them, disclosure could "give other countries an advantageous position in the race to attract such companies" and, finally, "significantly impair" the state aid review to be done by the EU Commission.[137]

Intel, a private company that actively sought public support, is effectively being treated as a diplomatic partner.

When it comes to public money, secret deals are a bad precedent. Transparency is the basic requirement to enable citizens to scrutinize public subsidies to corporations. The geopolitical chips power struggle cannot get in the way of public accountability.

Learning from the US

While the EU Chips Act is a response to the US Chips and Science Act of 2022 (US CHIPS), it compares poorly when it comes to public-interest conditionalities.

The US CHIPS Act had a more developed vision of how to leverage public subsidies for wider political goals, from the US's trade dispute with China to workers' rights. In fact, there are promising and ambitious conditions that companies must fulfill to be eligible.[138] A particular highlight is the obligation to develop a workforce development plan, including employer engagement, training, competitive wages, affordable childcare, and inclusion of disadvantaged people.[139] If these conditions are not met, funding can be stopped or the companies might even have to pay it back through a clawback mechanism.[140]

The US CHIPS Act is not perfect, and it remains to be seen how these conditionalities will be enforced in practice. Yet, unlike in the EU, US trade unions and civil society groups have been much more active in shaping it, actively pushing for stronger labor and environmental conditions.[141] It also shows the possibilities for leveraging available tools to shape the market in the public interest.

---

[137] Ibid.

[138] Julia Pamilih, "Industrial Policy with Conditionalities: U.S. CHIPS & Science Act," Reimagining the Economy, Malcolm Wiener Center for Social Policy, Harvard Kennedy School, February 21, 2024, https://www.hks.harvard.edu/centers/wiener/programs/economy/our-work/reimagining-economy-blog/industrial-policy.

[139] NIST, *Workforce Development Planning Guide: Guidance for CHIPS Incentives Applicants*," CHIPS Program Office, March 27, 2023, https://www.nist.gov/system/files/documents/2023/03/30/CHIPS%20Workforce%20Development%20Planning%20Guide%20%281%29.pdf.

[140] Fabio Bulfone, Donato Di Carlo, Filippo Bontadini, and Valentina Meliciani, "Adjusting to New Geopolitical Realities Semiconductors Industrial Policy in the US and EU," Istituto Affari Internazionali, May 23, 2024, https://www.iai.it/en/pubblicazioni/adjusting-new-geopolitical-realities-semiconductors-industrial-policy-us-and-eu.

[141] Communications Workers of America, "CHIPS Communities United: Over 50 National and Local Groups Call on Semiconductor Manufacturing Companies to Deliver on the Promise of Good Jobs, Stronger Communities, and Environmental Protections," press release, October 25, 2023, https://cwa-union.org/news/releases/chips-communities-united-over-50-national-and-local-groups-call-semiconductor.

Civil society organizations have also been leading the call to fix one of the US CHIPS Act's biggest problems: it does not entirely ban subsidized companies from using that money to pay out its shareholders and directors via stock buybacks.[142]

In the US, when awarding CHIPS subsidies, preference is to be given to companies that commit to conducting no stock buybacks for five years. However, Senator Elizabeth Warren has pointed out that BAE Systems was in the midst of a $2 billion buyback when it was awarded the subsidies; and Intel, the largest recipient in the US, has just been reauthorized by its board to buy back up to $7.24 billion.[143]

Stock buybacks are a big problem for the EU too. SOMO calculated that, from 2014 to 2023, ASML, the Dutch semiconductor champion, received €4.4 billion in tax rebates, enabling it to reach profits as high as €35.7 billion in a year.[144] In the very same period, the company passed on 80 percent of its profits to shareholders via untaxed dividend payments and share buybacks.[145] Most of these shareholders were outside the EU.

If EU policymakers are seriously trying to stimulate R&D and investment inside the single market, mandatory limits to buybacks must be carefully considered.

Industrial Policy Can Only Achieve Public Interest if it Includes the Public

At a time of pressing climate change, a cost-of-living crisis, and increasing levels of market and wealth concentration, the EU must ensure that its industrial policies don't end up accelerating inequality, unsustainable production, and market concentration. Policies should be built from the ground up with the public interest in mind, using conditionalities.

The trade union IndustriAll has, for instance, called for subsidies to be predicated on better value sharing with workers, an obligation to share profits obtained or to reinvest them within Europe, and goals to reduce emissions and water consumption.[146] European

---

[142] Sarah Anderson and Natalia Renta, *REPORT: Maximizing the Benefits of the CHIPS Program*, Institute for Policy Studies, July 11, 2024, https://ips-dc.org/report-maximizing-the-benefits-of-the-chips-program.

[143] Elizabeth Warren, "Warren, Casten, Foster, Jayapal to Commerce: No CHIPS Funding for Stock Buyback Subsidies," press release, July 1, 2024, https://www.warren.senate.gov/newsroom/press-releases/warren-casten-foster-jayapal-to-commerce-no-chips-funding-for-stock-buyback-subsidies.

[144] David Ollivier de Leth, "Overheid pampert ASML en aandeelhouders met 4,4 miljard euro belastingkorting," SOMO, June 4, 2024, https://www.somo.nl/nl/overheid-pampert-asml-en-aandeelhouders-met-44-miljard-euro-belastingkorting.

[145] Myriam Vander Stichele, "Why Share Buybacks Are Bad for the Planet and People," SOMO, July 19, 2024, https://www.somo.nl/why-share-buybacks-are-bad-for-planet-and-people.

[146] IndustriAll Europe, *The Semiconductor Industry in Europe: Between Geopolitics and Tech Race*, May 2024, https://www.industriall-europe.eu/documents/upload/2024/5/638503252902676944_semi_conductors_Draft_policy_brief_-_common_part_(002).pdf.

civil society organizations, including SOMO, have called for industrial policy to support a more diverse and balanced economy by avoiding support to dominant companies and implementing strict limitations on buybacks, executive pay, and dividend payments.[147]

For future EU digital industrial proposals to succeed where past initiatives have floundered, policymakers need to change course, deliver public transparency, and guarantee the inclusion of trade union and civil society voices.

[147] Margarida Silva, "Rebalancing Europe: A CSO Economic Agenda to Tackle Monopoly Power," SOMO, April 8, 2024, https://www.somo.nl/rebalancing-europe.

VII. Public Procurement as a Lever for Change

by MEP Kim Van Sparrentak and Simona de Heer

A small number of huge companies—Microsoft, OpenAI, and Alphabet—currently dominate in large language AI models. Because they have long had powerful positions, troves of data, and money to burn from existing markets, they could easily leverage themselves into the AI space. This has resulted in a worrying market-and-power concentration. Big market players are Google's Gemini; Amazon; and Google-backed Anthropic's Claude (OpenAI's GPT-series that powers Microsoft's Copilot), after multibillion-dollar investments in Open AI by Microsoft. OpenAI now runs primarily on Microsoft's Azure.[148] And Mistral, the EU's main attempt to compete with the American large language models, now also runs partly on Microsoft Azure after Microsoft's €15 million investment in Mistral.[149] Both Microsoft "partnerships" are being investigated by the European Commission for being anticompetitive.[150]

These infrastructural agreements paired with large investments show the link between concentration in both the AI market and the infrastructures on which the AI systems run. Microsoft's infrastructural power is leveraged into AI market share, as we see with the Microsoft-OpenAI partnership.

Concentration of Power in AI Is a Problem

What's wrong with this scenario? First of all, if only a small number of large companies control the majority of the world's AI systems and profit most, they gain the power to decide who gets access and under which conditions. This concentration in AI markets diminishes consumer choice, and erodes the autonomy for the people and organizations using AI, especially if they increasingly start relying on these systems. Ultimately, such market concentration has negative effects on accountability and it undermines our democracies if we rely on Big Tech's shareholders to make decisions in the public interest. Second, amid worldwide geopolitical tensions, and with the US being a less stable political

---

[148] Greg Brockman, Ilya Sutskever, and Sam Altman, "OpenAI and Microsoft," OpenAI, November 15, 2016, https://openai.com/index/openai-and-microsoft.
[149] Martin Coulter and Foo Yun Chee, "Microsoft's Deal with Mistral AI Faces EU Scrutiny," Reuters, February 27, 2024, https://www.reuters.com/technology/microsofts-deal-with-mistral-ai-faces-eu-scrutiny-2024-02-27.
[150] Gian Volpicelli, "Microsoft's AI Deal with France's Mistral Faces EU Scrutiny," *Politico*, February 27, 2024, https://www.politico.eu/article/european-commission-sets-its-sights-on-microsofts-ai-deal-with-frances-mistral.

ally than in past decades, such dependence on a small number of US companies for AI and cloud services jeopardizes the EU's strategic autonomy. For example, when Crowdstrike went down in July 2024, we witnessed how our dependence on a single company can plummet society into chaos: hospitals, trains, banks, and media outlets in the EU suddenly went dark.

Envisioning Solutions

We need to be ambitious. The EU must become digitally autonomous as soon as possible. In other words, the EU should no longer depend on large commercial tech companies for essential digital infrastructures, and the governance of these infrastructures should be kept as far as possible from commercial control. Beyond setting our own ethical standards for technology, as the EU has started doing with the AI Act, DMA, DSA, Data Act, and GDPR, the EU needs to build European alternative digital infrastructures. Access to an EU cloud could also benefit smaller ethical businesses and researchers running their AI.

One potential avenue for change that is currently not discussed much is the power of public procurement. With political commitment and investments through public procurement, we can change the current reality. Only then can we build the alternatives we want to see, instead of further reinforcing existing power structures.

Amsterdam has already committed to digital autonomy by 2030.[151] Today, the city already takes sustainability criteria and privacy into account in ICT public procurement. It also uses open-source software.[152] Before the end of 2024, Amsterdam will present different scenarios for a concrete procurement strategy, including "quick wins," challenges, and necessary conditionalities for public procurement.

We need similar ambition on an EU level. The Dutch government alone consistently pays Microsoft hundreds of millions of euros to run government services on Microsoft software. What if the Commission and all Member States came together and redirected the billions they already spend on Big Tech into secure, privacy-friendly, sustainable, and fast European digital infrastructure? We could invest billions of euros in ethical European initiatives rather than in Microsoft or Google.

Public procurement cannot be underestimated as a lever for change. Government contracts often represent a significant source of revenue for small and medium-sized enterprises (SMEs). Moreover, once a smaller business has a government stamp of

---

[151]"Agreement of the City Council with the Amended Initiative Proposal 'Amsterdam Digitally Independent' by Member IJmker," March 16, 2024, https://amsterdam.raadsinformatie.nl/document/13943325/1/09012f978106234b.
[152] Ibid.

approval and public investments have been secured, this attracts private investors and reduces the risk for private investments.

The key here is strict criteria and conditionalities, so that public procurement actively shapes our European economy. The EU is lagging in this area: even the US Inflation Reduction Act channels increased investments to businesses that meet climate, clean energy, and social standards.

Taxpayers' money should only go to the procurement option that is best for our society and economy—not only to the cheapest one. We therefore have to revise the European public procurement rules to ensure that sustainability, social standards, and privacy are binding criteria in tenders. Additionally, Member States should be able to consider their strategic autonomy and the long-term governance of the end product when purchasing, rather than being bound by the lowest price. Procurement procedures should be as simple and transparent as possible to enable small businesses and nonprofit initiatives to participate.

If we throw all our money at high-tech sectors such as AI without addressing the underlying infrastructural power dynamics, we ultimately reinforce our dependence on the same small number of large tech companies, doing very little for European SMEs.

For too long, we have allowed ourselves to believe that leaving digitization to the market would ensure freedom and prosperity for all. Now we are faced with the reality that the digital market is broken and led by a few companies who own the full digital stack, from basic essential infrastructure to consumer and government applications.

As Europeans, we know how our digital infrastructure works, so we can fix it when it breaks. We need a Europe where we set bold goals so that we know which values lie at the heart of it. The ultimate goal of Big Tech is profits. Governments should lead the way forward and set an example. This starts with clear political commitment and binding criteria in public procurement.

If the EU wants to take the lead in certain AI sectors, we need to start building safe, sustainable, and ethical European digital infrastructure.

Before starting any race, you need to clearly define the starting gates and the finish line, and set your goals. Only then can you work toward achieving those goals with the right focus and training, and a safe, healthy path. This is exactly what the EU should do.

VIII. Beyond Growth and Competitiveness: Shaping EU Trade Policy for People and the Planet

by Dr. Burcu Kilic

Industrial policy fell out of favor across much of the world during the first decade of the twenty-first century, particularly in the United States, where people were even reluctant to discuss it because of the risk of being associated with European-style socialism. But times have changed. Industrial policy is no longer taboo—it's experiencing a revival not only in the US, but also globally. Policymakers and thought leaders increasingly embrace a robust industrial policy as crucial for securing future economic strength and competitiveness.

In an effort to catch up with this global shift, the European Union has unveiled a new, more proactive industrial strategy to make the EU more competitive, particularly in digital technologies and AI. The Draghi report on *The Future of European Competitiveness*[153] outlines ambitious plans to address Europe's economic challenges, proposing a large-scale industrial policy, an innovation-focused competition policy, and the strategic use of state aid.[154] It echoes some of the long-standing arguments advanced by tech companies and their allies, particularly regarding Europe's regulations, which, since the early debates on GDPR, they have argued are burdensome and costly. The report repeatedly references the US, comparing innovation and competitiveness between the US and the EU, and concludes that Europe should follow the US model, advocating for a rebalancing of European regulations and, to some extent, a shift toward deregulation—disregarding the Biden administration's strong stance, which emphasizes that markets need to be regulated to function properly.

This aspect of the report has dominated headlines, but the report offers more than just a critique of regulatory frameworks. What stands out as particularly groundbreaking is the

---

[153] European Commission, *The Future of European Competitiveness*, September 2024, https://commission.europa.eu/document/download/97e481fd-2dc3-412d-be4c-f152a8232961_en?filename=The%20future%20of%20Europea n%20competitiveness%20_%20A%20competitiveness%20strategy%20for%20Europe.pdf.

[154] Cristina Caffarra, "Draghi's Real Message on European Competition Enforcement: 'Not Delivering on Innovation and Growth,'" VoxEU, Centre for Economic Policy Research (CEPR), September 18, 2024, https://cepr.org/voxeu/columns/draghis-real-message-european-competition-enforcement-not-delivering-innovation-and.

report's recognition of "hyper-globalisation" and the failure of policymakers to address its social consequences. The report also questions an overemphasis on GDP growth at the expense of labor income and economic resilience. It calls on policymakers to adopt a more inclusive approach, questioning who benefits from these policies and who is left behind. Draghi advocates for a robust social dialogue, encouraging collaboration between trade unions, employers, and civil society actors to set objectives and actions for transforming Europe's economy in a more inclusive and equitable manner.

The new strategy attempts to integrate trade policy into a broader European industrial policy through careful, case-by-case analysis rather than through adopting generic trade stances. However, it misses the point as it gets lost in the neoliberal trade narrative. It recommends maintaining low trade barriers for digital goods, services, and infrastructure with the US to ensure access to the latest AI models and processors. While low trade barriers may benefit Big Tech companies, especially those concerned about European regulations that protect privacy, workers, competition, and democracy—often claimed as nontariff barriers—it is unclear how this supports European industrial strategy or helps Europe break free from Big Tech's market dominance in AI.

The proposal overlooks a key point: industrial policy and the neoliberal trade agenda are not compatible. Trade policy has traditionally been designed to restrict the tools of industrial policy. In fact, what companies often label as "trade barriers" are the very measures industrial policy depends on. The neoliberal global trade system operates with a winner-take-all mindset, limiting the policy space countries need to develop their own industrial strategies and to protect workers, citizens, planet, and democracy.[155]

Since the 1980s, the neoliberal consensus, primarily driven by Washington, has shaped global trade. Trade agreements dismantled barriers to trade and financial flows, reduced regulation, and minimized government involvement in the economy. The World Trade Organization and trade policymakers treated industrial policy as taboo, rejecting market-shaping to serve national interests and values.[156]

Recently, in the United States, the Biden administration has moved away from traditional trade agreements that prioritize tariff liberalization and corporate interests. Instead, the administration ensures that trade policy goes hand in hand with domestic industrial policy aimed at reindustrialization, diversifying production (through friendshoring, nearshoring,

[155] Nancy Fraser, "From Progressive Neoliberalism to Trump—and Beyond," *American Affairs* 1, no. 4 (Winter 2017), https://americanaffairsjournal.org/2017/11/progressive-neoliberalism-trump-beyond.
[156] Kathleen R. McNamara, "The Politics of European Industrial Policy: How a Post-Neoliberal Shift Is Transforming the European Union," working paper presented to GRIPE, February 15, 2023, https://gripe.polisci.ucla.edu/wp-content/uploads/sites/121/2023/01/GRIPE_S0702_McNamara.pdf.

and reshoring) and creating a more resilient trade policy that centers American workers. This worker-centered trade policy challenges the long-standing assumption that what benefits US corporations automatically benefits Americans as a whole.[157]

Historically, US trade policies have been heavily influenced by corporations—often at the expense of workers, small businesses, farmers, and the environment—driven by a trickle-down mentality. Today, effective trade policy requires understanding the global competitive landscape, including how digital technologies, market concentration, and unfair competition disadvantage workers. It also demands addressing the urgent climate crisis. Incidentally, this is precisely what we have seen in the US under the Biden administration: The United States Trade Representative (USTR) now prioritizes close collaboration with labor, civil, environmental, and human rights groups to guide trade policy.[158]

This shift in trade policymaking is especially evident in digital trade. Rather than simply championing American innovation and competitiveness, the USTR now challenges the unchecked power of tech companies, emphasizing the need for responsibility and accountability in the digital economy and the importance of giving small and medium-sized enterprises (SMEs) a fighting chance. This highlights the increasing importance of digital trade for domestic policymaking. US digital trade policy prioritizes the country's ability to shape the digital economy. It seeks to complement, not override, domestic regulations and industrial policies, aiming to balance the interests of big tech companies, SMEs, workers, consumers, and the broader public.

The EU's digital trade policy, on the other hand, has long taken a neoliberal approach, promoting tech-driven globalization while remaining disconnected from broader EU policies and priorities. The only significant exception has been privacy,[159] which benefits both from being a long-standing European value and from the efforts of the Directorate-General for Justice and Consumers (DG Justice) to protect privacy as a fundamental right in trade agreements.[160] Beyond that, DG Trade takes a technocratic approach, overly focused on addressing so-called trade barriers, often reinforcing the ad-driven surveillance-capitalist business model of dominant US companies in EU trade

[157] Office of the United States Trade Representative, "Fact Sheet: In Year 2, Ambassador Katherine Tai and USTR Continued to Execute President Biden's Vision for Worker-Centered Trade Policy," March 2023, https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2023/march/fact-sheet-year-2-ambassador-katherine-tai-and-ustr-continued-execute-president-bidens-vision-worker.

[158] Office of the United States Trade Representative, "Fiscal Year 2025 Budget," March 2024, https://ustr.gov/sites/default/files/foia/USTRFY2025CongressionalBudget.pdf.

[159] Burcu Kilic, "As Global Trade Goes Digital, Trust Becomes Critical," Centre for International Governance Innovation, February 29, 2024, https://www.cigionline.org/articles/as-global-trade-goes-digital-trust-becomes-critical.

[160] European Commission, "Horizontal Provisions on Cross-Border Data Flows and Personal Data Protection," May 18, 2018, https://ec.europa.eu/newsroom/just/items/627665.

agreements. After the US shift in digital trade,[161] the EU, along with Singapore, Japan, and Australia (perhaps in exchange for billions of tech investments[162] in data centers[163]), became the guardians of surveillance-capitalist digital trade rules, most notably in the World Trade Organization's Joint Statement Initiative on Electronic Commerce.[164] These rules have far-reaching consequences, affecting not only the economy but also digital infrastructure, balance of power, information ecosystems, society at large, and democracy worldwide.

Modern industrial policies require coordination across multiple fronts. To be effective, industrial, competition, and trade policies must be aligned.[165] They need to work together as part of a unified strategy that prioritizes supporting European innovation, social inclusion, and core European values such as democracy, equality, the rule of law, and human rights, rather than supporting the surveillance-capitalist business model of big tech companies, which concentrates both economic and political power, thereby posing risks to democracy. The EU's trade policy should reinforce and complement European industrial policies and regulations that protect European rights and values, not undermine them.

Draghi suggests that the EU should follow the US example in boosting productivity and growth. This suggestion should extend to trade policy, particularly digital trade, encouraging a rethinking of EU trade policies to implement positive and durable change that prioritizes people and the planet. What truly matters most is the consequences of growth, not growth *qua* growth. Growth that focuses solely on increasing per capita GDP can undermine key objectives like social inclusion and protecting the planet, workers, people, and democracy. Ultimately, it is not just trade—it is also about who gets to define the rules of the global digital economy and whose interests those rules will serve. European workers and citizens should have a voice in this, just like American workers and citizens do.

---

[161] Burcu Kilic, "Washington Takes a Step Toward Greater Openness in Digital Trade," Centre for International Governance Innovation, November 16, 2023, https://www.cigionline.org/articles/washington-takes-a-step-toward-greater-openness-in-digital-trade.
[162] Matthew Gooding, "Brad Smith: Microsoft to Spend $2.9bn on Japanese Data Centers," Data Center Dynamics, April 9, 2024, https://www.datacenterdynamics.com/en/news/brad-smith-microsoft-to-spend-29bn-on-japanese-data-centers.
[163] "Microsoft To Establish Nine New Data Centers in Australia," Bloomberg News, October 24, 2023, https://www.datacenterknowledge.com/hyperscalers/microsoft-to-establish-nine-new-data-centers-in-australia.
[164] Ministry of Economy, Trade and Industry (METI), "Stabilised Text Achieved in WTO Joint Statement Initiative on Electronic Commerce," press release, July 26, 2024, https://www.meti.go.jp/english/press/2024/0726_001.html.
[165] European Commission, "EU Competitiveness: Looking Ahead," September 2024, https://commission.europa.eu/topics/strengthening-european-competitiveness/eu-competitiveness-looking-ahead_en.

IX. The Openness Imperative: Charting a Path for Public AI

by Udbhav Tiwari

In the recent headlong proliferation of AI technologies, critical questions about who benefits from these advances and whether these changes are necessarily positive for society are often overlooked.[166] The current AI ecosystem is dominated by a few tech giants[167] whose incentives misalign with the public interest, necessitating a radical approach that empowers broader communities to shape this trajectory in line with societal norms. Openness, while not a panacea, can serve as a cornerstone of recent efforts to reverse the many worrying manifestations of corporate consolidation.

Open source—the practice of making software code freely available for anyone to use, modify, and distribute—has already transformed the tech industry over the past few decades.[168] From Linux to Android, open source operating systems and tools have enabled an entire ecosystem of developers, startups, and even big companies to build on top of shared digital infrastructure. This collaborative model has accelerated innovation, improved security through many eyes on the code, and given consumers and developers greater choice in their daily lives.[169] It is by no means perfect, with the systemic vulnerabilities of relying on unpaid labor to run critical infrastructure,[170] and the non-benign incentives of capturing developer mindshare[171] often being the top critiques. However, there is no disputing the fact that it is an effective tool to provide greater access to and transparency of critical technologies to a much wider set of stakeholders than more prevalent closed models.[172]

---

[166] Peter Dizikes, "Who Will Benefit from AI?" MIT News, September 29, 2023, https://news.mit.edu/2023/who-will-benefit-ai-machine-usefulness-0929.

[167] Competition and Markets Authority, *AI Foundation Models: Update Paper*, April 11, 2024, https://assets.publishing.service.gov.uk/media/661941a6c1d297c6ad1dfeed/Update_Paper__1_.pdf.

[168] Knut Blind, Sivan Pätsch, Sachiko Muto, Mirko Böhm, Torben Schubert, Paula Grzegorzewska, and Andrew Katz, *The Impact of Open Source Software and Hardware on Technological Independence, Competitiveness and Innovation in the EU Economy*, European Commission: Directorate-General for Communications Networks, Content and Technology, 2021, https://data.europa.eu/doi/10.2759/430161.

[169] Mark Perry and Thomas Margoni, "Free-Libre Open Source Software as a Public Policy Choice, " *International Journal on Advances in Internet Technology* 3, nos. 3 and 4 (December 2010): 212–222, https://ssrn.com/abstract=1800902.

[170] Mathieu O'Neil, Xiaolan Cai, Laure Muselli, Fred Pailler, and Stefano Zacchiroli, *The Coproduction of Open Source Software by Volunteers and Big Tech Firms*, News Media Research Centre, University of Canberra, 2021, https://doi.org/10.25916/r8vg-hd09.

[171] Shai Almog, "Open Source Bait and Switch," Java, Debugging, DevOps & Open Source (blog), August 23, 2022, https://debugagent.com/open-source-bait-and-switch.

[172] Francisco Eiras, Aleksander Petrov, Bertie Vidgen, Christian Schroeder, Fabio Pizzati, Katherine Elkins, Supratik Mukhopadhyay, Adel Bibi, Aaron Purewal, Csaba Botos, Fabro Steibel, Fazel Keshtkar, Fazl Barez, Genevieve Smith, Gianluca Guadagni, Jon Chun, Jordi Cabot, Joseph Imperial, Juan Arturo Nolazco, Lori Landay, Matthew Jackson, Phillip H. S. Torr, Trevor Darrell, Yong Lee, and Jakob Foerster, "Risks and Opportunities of Open-Source Generative AI," arXiv:2405.08597v3 [cs.LG], May 29, 2024, https://doi.org/10.48550/arXiv.2405.08597.

Despite these underpinnings and a rich initial history of open science-driven publications, openness in the development and deployment of AI is becoming the exception rather than the norm. In order to counter this trend, many organizations, including Mozilla, are calling for a movement in "public AI"—a robust ecosystem of initiatives that promote public goods, public participation, and public benefit throughout the AI life cycle.[173]

Openness as the Fuel for Public AI

Meaningful openness is a key component of public interest AI because it challenges entrenched and concentrated power dynamics.[174] A few Big Tech companies currently act as gatekeepers to critical AI capabilities, locking up their models, datasets, and tools behind proprietary licenses and steep price tags. This limits who can access and build on top of state-of-the-art AI while further concentrating technical capabilities behind conglomerates.[175] It also means we're largely leaving it up to those few companies to decide the future of the technology—ample evidence from the past two decades demonstrates that that is an unwise call.[176]

By contrast, development catalyzed by public investment with the goal of creating alternative paradigms (public AI) would enable a larger and more diverse set of actors—from startups to academics to civil society—to participate in genuinely steering the technology's future.[177] No single entity would unilaterally decide or control the future of such projects, especially when limited by governance mechanisms. Instead, the diverse contributors would share the responsibility of key design decisions and also suggest improvements to mitigate risks, such as bias, inherent in these systems.[178] This decentralized participation is essential for keeping AI technologies accountable to public interest.

---

[173] Nik Marda, Jasmine Sun, and Mark Surman, *Public AI: Making AI Work for Everyone, by Everyone*, Mozilla, September 2024, https://assets.mofoprod.net/network/documents/Public_AI_Mozilla.pdf.
[174] Ibid, 10.
[175] David Gray Widder,Sarah West, and Meredith Whittaker, "Open (For Business): Big Tech, Concentrated Power, and the Political Economy of Open AI," August 17, 2023, accepted to appear in *Nature*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4543807.
[176] Bill Whyman, "AI Regulation Is Coming – What Is the Likely Outcome?" Center for Strategic and International Studies, October 10, 2023, https://www.csis.org/blogs/strategic-technologies-blog/ai-regulation-coming-what-likely-outcome.
[177] Marda, Sun, and Surman, *Public AI*, 23.
[178] Abby Seneor and Matteo Mezzanitte, "Open-Source Data Science: How to Reduce Bias in AI," World Economic Forum (blog), October 14, 2022, https://www.weforum.org/agenda/2022/10/open-source-data-science-bias-more-ethical-ai-technology.

Unlocking the Public Good

None of these success conditions are guaranteed unless we ensure that openness is not used to provide a fake veneer of positivity to further the consolidation of large technology companies rather than advance the public interest.

First, open source tools and models must be truly open and accessible, not just in licensing but in practice. On licensing, it is key that AI that calls itself open source meet the full definition of recent efforts by the Open Source Initiative (OSI). Openwashing is a real risk,[179] and merely releasing model weights provides only some of the benefits we've come to expect from open source.[180] Beyond licensing, the compute and data needed to use (run, train, or both) large-scale and competitive open source AI models remain prohibitively expensive and scarce.[181] To counter this trend, governments and funders must invest in shared infrastructure like public compute, encourage open datasets that meet ethics and privacy standards, and expand public research in universities—prioritizing domains and use cases neglected by the private market and even funding alternatives to them.[182] This effort, which should be coordinated across governments, is necessary to reduce barriers to entry and to enable more public-interest applications of AI in a sustainable manner.

Second, open source AI initiatives funded by these actors must prioritize public participation and accountability, not just openness for its own sake.[183] Impacted communities should have a voice in identifying challenges to tackle and values to uphold. We've already seen the positive impact that grassroots organizations like EleutherAI can have on the ecosystem when centering the community rather than financial incentives.[184] On accountability, which should be enforced in law, public audits, impact assessments, and third-party scrutiny are essential for responsible AI deployment to meet the goals of

---

[179] Alek Tarkowski, "The Mirage of Open-Source AI: Analyzing Meta's Llama 2 Release Strategy," Open Future (blog), August 11, 2023, https://openfuture.eu/blog/the-mirage-of-open-source-ai-analyzing-metas-llama-2-release-strategy.

[180] Francisco Eiras, Aleksander Petrov, Bertie Vidgen, Christian Schroeder, Fabio Pizzati, Katherine Elkins, Supratik Mukhopadhyay, Adel Bibi, Aaron Purewal, Csaba Botos, Fabro Steibel, Fazel Keshtkar, Fazl Barez, Genevieve Smith, Gianluca Guadagni, Jon Chun, Jordi Cabot, Joseph Imperial, Juan Arturo Nolazco, Lori Landay, Matthew Jackson, Phillip H. S. Torr, Trevor Darrell, Yong Lee, and Jakob Foerster, "Risks and Opportunities of Open-Source Generative AI," arXiv:2405.08597v3 [cs.LG], May 29, 2024, https://doi.org/10.48550/arXiv.2405.08597.

[181] Jai Vipra and Sarah Myers West, "Computational Power and AI," AI Now Institute, September 27, 2023, https://ainowinstitute.org/publication/policy/compute-and-ai.

[182] Marda, Sun, and Surman, *Public AI*, 23.

[183] Alexandra Theben, Laura Gunderson, Laura López-Forés, Gianluca Misuraca, and Francisco Lupiáñez-Villanueva, "Challenges and Limits of an Open Source Approach to Artificial Intelligence," European Parliament, Policy Department for Economic, Scientific and Quality of Life Policies, May 2021, https://www.europarl.europa.eu/thinktank/en/document/IPOL_STU(2021)662908.

[184] Jason Phang, Herbie Bradley, Leo Gao, Louis Castricato, and Stella Biderman, "EleutherAI: Going Beyond 'Open Science' to 'Science in the Open'," arXiv:2210.06413v1 [cs.CL], October 12, 2022, https://doi.org/10.48550/arXiv.2210.06413.

being viable alternatives. The diversity and interdisciplinary collaboration in open source AI communities can help mitigate (but not entirely solve) many of the risks we've also come to expect from closed offerings.

Finally, the benefits of such public AI systems must redound to the public—not serve to concentrate power in the hands of a few—via both industrial policy and competition enforcement. Policymakers should attach conditionalities to public funding, such as open licensing requirements and public governance to ensure effective oversight.[185] Far more effective antitrust enforcement and other regulatory interventions are also needed to provide a level playing field to ensure these alternatives have a fair chance at competing with large players.[186]

Openness as a Tool, Not a Cure

It is crucial to recognize that open source is neither a silver-bullet solution to the challenges posed by concentrated market power in AI, nor will it automatically lead to AI technologies in the public interest.[187] Even open source communities can trend toward homogeneity and concentrate power if not structured intentionally.[188] The steep compute costs required to train and run the latest open source AI can still be exclusionary, favoring well-resourced entities over smaller players and public-interest initiatives.[189] And openness itself does not guarantee responsible development and lack of societal harms.

As Europe charts its course on AI, policymakers, funders, and technologists should invest in the conditions needed for open source to thrive in the service of public interest, while also advancing complementary solutions to structural power imbalances. These include robust antitrust enforcement to prevent anticompetitive conduct and promote a diverse AI market; the attachment of strong public-interest conditions to industrial policy interventions such as government funding for research and infrastructure to prevent it from enriching large private labs; and the development of new models of data stewardship and governance that give communities a stake in how their data is collected and used.

[185] Free Software Foundation Europe, "Public Money, Public Code," 2018, https://publiccode.eu/en.

[186] Barry Lynn, Max von Thun, and Karina Montoya, *AI in the Public Interest: Confronting the Monopoly Threat*, Open Markets Institute, November 2023, https://www.openmarketsinstitute.org/publications/report-ai-in-the-public-interest-confronting-the-monopoly-threat.

[187] Widder, West, and Whittaker, "Open (For Business)."

[188] Alicja Peszkowska, "AI and the Commons: The Paradox of Open (for Business)," Open Future (blog), January 11, 2024, https://openfuture.eu/blog/ai-and-the-commons-the-paradox-of-open-for-business.

[189] Elizabeth Segerand Bessie O'Dell, "Open Horizons: Exploring Nuanced Technical and Policy Approaches to Openness in AI," Demos, September 2024, https://demos.co.uk/research/open-horizons-exploring-nuanced-technical-and-policy-approaches-to-openness-in-ai.

Most crucially, it necessitates ongoing public oversight and accountability measures to audit AI systems for bias, safety, and alignment with societal values.

If our future with AI is still being written, it's time to open up who gets to hold the pen. But openness alone is not enough; we need a holistic approach that bakes in public participation, accountability, and equity from the start. Only then can we ensure that the coming wave of AI technologies truly serves the public good.

X. European Digital Independence: Building the EuroStack

by Assoc. Prof. Francesca Bria

A Public-Interest Digital Industrial Strategy

As digital services increasingly underpin critical sectors—healthcare, energy, transportation, and public administration—the ability to control and govern these infrastructures becomes a matter of strategic importance. Relying on external cloud services and AI capabilities means that sensitive data and strategic assets remain vulnerable to foreign policies and legal frameworks, such as the US CLOUD Act,[190] which could mandate data access without European consent. This dependence on non-European providers fundamentally undermines data sovereignty, leaving Europe's strategic autonomy at risk.

This moment offers Europe a rare chance to reconquer its digital sovereignty. With a new Executive Vice President of the European Commission focused on technological sovereignty, security, and democracy, Europe can build the EuroStack:[191] independent digital infrastructure that includes cloud computing, advanced chips, AI, digital IDs, data spaces, and payment systems.[192] These digital assets are as crucial today as roads and electricity, providing the backbone for modern public services like healthcare, social welfare, and education. They must be treated as public goods, governed by European standards to serve collective interests rather than monopolistic enterprises.

Europe's reliance on imported digital technologies—over 80 percent of its digital services and products—has emerged as a major strategic vulnerability.[193] In the modern era, sovereignty extends beyond traditional geopolitical and economic concerns to include a critical digital dimension. True digital sovereignty now involves securing access to key

[190] For one summary, see Georgia Wood and James Andrew Lewis, "The CLOUD Act and Transatlantic Trust," Center for Strategic and International Studies, March 29, 2023, https://www.csis.org/analysis/cloud-act-and-transatlantic-trust.https://www.csis.org/analysis/cloud-act-and-transatlantic-trust.

[191] "Toward European Digital Independence: Building the Euro Stack," Digital Independence, accessed October 15, 2024, digitalindependenceeu.wordpress.com.

[192] Francesca Bria, "Open, Sovereign, Independent AI: Europe's Greatest Challenge," Medium, December 10, 2023, https://medium.com/@francescabria/open-sovereign-independent-ai-europes-greatest-challenge-6c8a899041ec.

[193] European Commission, "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions State of the Digital Decade 2024," COM(2024) 206 final, https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52024DC0260.

resources like lithium, semiconductors, data, and AI capabilities—the contemporary equivalents of coal and steel. Achieving this requires new forms of cooperation and governance to strengthen Europe's economic resilience and foster sustainable growth, especially in light of escalating geopolitical tensions and supply chain disruptions. Without decisive action, Europe risks shifting from its past dependence on oil and gas to a new dependence linked to digital infrastructures and critical raw materials.

To reduce its dependence on foreign cloud providers, Europe has initiated projects like Gaia-X, aiming—though with limited success—to create a cloud ecosystem that prioritizes data sovereignty and complies with European regulations.[194] Competing with the scale and reach of US hyperscalers remains a significant challenge. However, efforts to address this dependency have gained momentum, driven by post-pandemic government investment programs. The Digital Europe Programme, for instance, focuses on high-performance computing (HPC), cybersecurity, and digital skills development. Industrial collaborations through Important Projects of Common European Interest (IPCEI) have also targeted strategic sectors such as microelectronics and edge and cloud technologies.[195] Additionally, the Next Generation EU initiative has allocated over €800 billion of European common debt, with more than 20 percent dedicated to digital transformation and strengthening Europe's technological capabilities.[196] Yet, questions remain about how effectively these resources have been allocated and whether they are genuinely fostering independent European tech players, rather than deepening dependencies on existing tech giants.

Examining the deeper layers of the tech stack, particularly in critical semiconductors, remains a complex endeavor. Building domestic capacity in advanced chip production is essential for reducing Europe's dependence on foreign suppliers, though it remains a challenging goal. The rapid growth of AI has concentrated control over critical resources—data, computing power, and advanced chips—in the hands of a few dominant Big Tech firms. These companies shape the digital landscape and control market access, creating significant dependencies for industries, small and medium-sized enterprises (SMEs), public institutions, workers, and citizens alike.

To counter this concentration of power, robust antitrust measures and strategic investments in alternative solutions are essential. Policies like enforcing nondiscrimination rules—which guarantee fair access to digital services—and implementing structural separation to prevent companies from controlling both cloud infrastructure and AI applications can help curb their dominance. Additionally, publicly funded alternatives should prioritize AI development that addresses societal needs, safeguards workers' rights, and protects vulnerable groups from harmful applications. By creating

---

[194] Gaia-X, accessed October 12, 2024, https://Gaia-X.eu. See also the interview with Francesco Bonfiglio in this collection.
[195] European Commission, "IPCEI on Next-Generation Cloud Infrastructure and Services to Boost Europe's Digital Decade," December 5, 2023, https://digital-strategy.ec.europa.eu/en/news/ipcei-next-generation-cloud-infrastructure-and-services-boost-europes-digital-decade.
[196] For the scoreboard on the investments, see European Commission, "Recovery and Resilience Scoreboard," accessed October 12, 2024, https://ec.europa.eu/economy_finance/recovery-and-resilience-scoreboard/digital.html.

independent options, developers can build their own AI models without relying on the existing AI oligopoly. This strategy promotes competition, preserves digital sovereignty, and drives innovation in key areas like climate action, healthcare, renewable energy, sustainable mobility, and education.

Europe's push for a green and digital future also faces significant challenges due to the environmental impact of AI and cloud computing. Data centers, crucial for training AI models, consume vast amounts of energy and water, putting pressure on power grids and complicating climate targets. The International Energy Agency (IEA) warns that global electricity demand from data centers could more than double by 2026.[197] In Europe, data centers already consume 2.7 percent of the continent's total electricity, with Ireland particularly impacted:[198] 20 percent of its national energy use is dedicated to data centers, exceeding the consumption of all residential buildings combined. [199]

Investments such as the $30 billion fund from Microsoft and BlackRock are only accelerating this unsustainable demand,[200] with data centers often strategically placed near nuclear plants to ensure stable power.[201] This expansion, however, puts additional strain on energy infrastructure, further complicating efforts to achieve a sustainable energy transition. Emissions from companies like OpenAI and Google have surged—nearly 30 percent for OpenAI since 2020 and almost 50 percent for Google between 2019 and 2023[202]—driven by the expansion of their data center operations. The use of renewable energy certificates and creative accounting practices by Big Tech often masks their true environmental footprint, revealing a need for greater transparency reporting on emissions, energy consumption, and water usage. To align digital infrastructure growth with Europe's climate goals, data centers and digital systems must prioritize decarbonization, resource efficiency, and sustainable management.

Independent Next-Generation Digital Public Infrastructures

[197] Matthew Gooding, "Global Data Center Electricity Use to Double by 2026 - IEA Report," Data Centre Dynamics, January 26, 2024, https://www.datacenterdynamics.com/en/news/global-data-center-electricity-use-to-double-by-2026-report.
[198] European Commission, "Green and Digital: Study Shows Technical and Policy Options to Limit Surge in Energy Consumption for Cloud and Data Centres," November 9, 2020, https://commission.europa.eu/news/green-and-digital-study-shows-technical-and-policy-options-limit-surge-energy-consumption-cloud-and-2020-11-09_en.
[199] Jude Webber and Malcolm Moore, "Ireland Struggles to Consolidate Role as Data Centre Hub," *Financial Times*, October 7, 2024, https://www.ft.com/content/9ab958bf-41dc-4d38-81e1-b311c9e57332.
[200] "Microsoft, BlackRock to Launch $30 Billion Fund for AI Infrastructure," Reuters, September 17, 2024, https://www.reuters.com/technology/artificial-intelligence/microsoft-blackrock-plan-30-bln-fund-invest-ai-infrastructure-ft-reports-2024-09-17.
[201] C Mandler, "Three Mile Island Nuclear Plant Will Reopen to Power Microsoft Data Centers," NPR, September 20, 2024, https://www.npr.org/2024/09/20/nx-s1-5120581/three-mile-island-nuclear-power-plant-microsoft-ai.
[202] Katie Bartlett, "Google's Carbon Emissions Surge Nearly 50% Due to AI Energy Demand," CNBC, July 2, 2024, https://www.cnbc.com/2024/07/02/googles-carbon-emissions-surge-nearly-50percent-due-to-ai-energy-demand.html.

Europe's digital future depends on its ability to build an independent digital ecosystem—what we call the EuroStack. At its heart, this effort is about reclaiming technological sovereignty and reducing dependence on US and Chinese Big Tech. Today, a few dominant companies control critical digital infrastructure, data flows, and computational power, shifting the balance of the digital world away from democratic values and toward corporate interests. Without a coordinated and ambitious EuroStack initiative, Europe risks remaining a passive consumer in the digital economy, vulnerable to the strategic interests and geopolitical shifts of others.

Realizing the EuroStack requires more than rhetoric; it demands a clear industrial policy and bold, targeted investments that support local innovation and create a digital ecosystem aligned with democratic values: privacy, transparency, sustainability, and accountability. As Mario Draghi has advocated for, a commitment of €800 billion is needed to bridge the innovation gap.[203] President von der Leyen's proposed Competitiveness Fund[204] and the €100 billion European AI initiative—similar to a CERN for AI[205]—are crucial as they aim to match the ambition of the US's $280 billion CHIPS and Science Act.

The European Technological Sovereignty Fund could be a first necessary step to accelerate EuroStack's development. This first effort should focus on developing a core Digital Public Infrastructure layer that includes a vital component for modern society, encompassing digital IDs, a digital euro, and data management and exchange systems. Digital systems have become vital to the delivery of essential services, including vaccine distribution, social welfare, healthcare, and education. These systems form the backbone of the European social model, which is rooted in the principles of social protection, rights, freedoms, equality, and solidarity—values developed in the aftermath of World War II. However, the digital transition is putting this model under strain, making it imperative to ensure democratic control of digital infrastructures.[206] Without such control, the integrity of Europe's welfare state and its commitment to serving the public good are at risk.

These infrastructures should be designed as independent, open platforms to prevent corporate dominance and ensure transparency. The EuroStack initiative could bring together a task force pooling expertise from national innovation agencies, Europe's most talented scaleups and industry leaders; and blend grants with equity investments to integrate virtuous national and EU initiatives into a cohesive "Europe Stack," supported by an independent governance framework. Grants should be targeted to increase risk

[203] Giovanna Faggionato, "Draghi Demands €800B Cash Boost to Stem Europe's Rapid Decline," *Politico*, September 9, 2024, https://www.politico.eu/article/mario-draghi-report-says-eu-must-spend-twice-as-much-after-wwii.
[204] "EU Executive to Propose Competitiveness Fund for Strategic Technologies," Reuters, July 18, 2024, https://www.reuters.com/world/europe/eu-executive-propose-competitiveness-fund-strategic-technologies-2024-07-18.
[205] Jacob Wulff Wold, "Von der Leyen Gives Nod to €100 Billion CERN for AI Proposal," Euractiv, July 25, 2024, https://www.euractiv.com/section/digital/news/von-der-leyen-gives-nod-to-e100-billion-cern-for-ai-proposal.
[206] Francesca Bria, "Europe's Clash with Big Tech is not about free speech, it's about upholding democracy and digital independence ," Medium, September 28, 2024, https://medium.com/@francescabria/europes-clash-with-big-tech-is-not-about-free-speech-it-s-about-upholding-democracy-and-digital-5fcb6f89889b.

capacity and offer patient capital for long-term projects, while unlocking private and institutional capital will be essential to scaling Europe's digital infrastructure. This funding strategy must also incorporate a gender and inclusion lens, ensuring that all Europeans can participate in and benefit from the broader digital ecosystem.

Collaboration among EU Member States and EU institutions is essential. Building shared, interoperable, digital public infrastructures can deliver next-generation services across Europe and offer true alternatives to monopolistic platforms. This includes fostering open, decentralized AI models and solutions tailored to Europe's strategic sectors, ensuring that essential digital tools do not remain tied to US-based cloud giants like AWS, Azure, or Google Cloud.

A part of this ambitious strategy could be reforming digital taxation to ensure that Big Tech pays taxes where they generate profits and collect data. These revenues should be reinvested into the European Technological Sovereignty Fund.The success of the EuroStack depends on a clear industrial policy with concrete goals, streamlined decision-making, and adaptable state aid rules.

Emphasizing open-source and privacy-enhancing technologies, data sovereignty, and interoperability is key to release dependency on proprietary systems and surveillance business models, based on the monetization and manipulation of personal data. Data should be treated as a public resource that generates public value while safeguarding privacy and rights. We need data intermediaries that prioritize the public interest, with mandates for data sharing and interoperability embedded in procurement processes.[207] It's also essential to include provisions for data access, transparency, and accountability regarding the use of data for AI model training in procurement contracts and public tenders or licensing.

Aligning the EuroStack with Europe's climate ambitions is equally vital. The rapid growth of AI-driven data centers has led to higher energy consumption and pressure on power grids. Integrating decarbonization, energy efficiency, and non-exploitative resource management into the EuroStack will ensure that digital progress does not come at the expense of environmental responsibility.

Moreover, the global dimension of the EuroStack's benefits is clear in a shifting geopolitical landscape. Such an architecture fosters collaboration with other regions and strengthens international digital cooperation, scientific exchange, and economic partnerships. It allows Europe to position itself as a partner in the codevelopment of global digital public goods, working alongside countries like Brazil, Taiwan, and India—nations

---

[207] Bria et. al., "Governing Urban data for the Public Interest", The New Institute, October 2023
https://thenew.institute/media/pages/documents/529e984d02-1698245881/the-new-hanse_blueprint_governing-urban-data-for-the-public-interest.pdf.

that are also building digital public infrastructures.[208] By developing the EuroStack, Europe can move beyond being perceived merely as a digital regulator, and instead become a true collaborator in shaping a fairer digital future. This partnership approach allows Europe to build alliances with the Global South and like-minded countries, creating new opportunities for shared technological advancement that benefits humanity and the planet.

Ultimately, the EuroStack is not just a technological project—it is a political one. It offers Europe the chance to shape a digital economy that aligns with democratic principles and serves the public good, instead of ceding control to a handful of powerful corporations. This is Europe's moment to seize control of its digital destiny and lead the way toward a more equitable, sustainable digital society.

---

[208] Luca Belli, "Building Good Digital Sovereignty through Digital Public Infrastructures and Digital Commons in India and Brazil," CyberBRICS, September 11, 2023, https://cyberbrics.info/building-good-digital-sovereignty-through-digital-public-infrastructures-and-digital-commons-in-india-and-brazil.

XI. Why Europe's Cloud Ambitions Have Failed

Interview by Mark Scott, with Francesco Bonfiglio

Francesco Bonfiglio had a front-row seat in Europe's previous attempts at digital sovereignty.

As the former chief executive of the Gaia-X, an association created in 2020 to develop decentralized networks of cloud computing services across the European Union, the Italian oversaw a project that has become a political priority for Europe's leaders — to create local digital alternatives to compete with international tech giants.

Not everything has gone to plan.

Five years into Gaia-X's work, and the association has been the center of bitter battles between its members, some of which, like Microsoft and Amazon, are US-hyperscalers. Europe's collective market share of the cloud computing industry has fallen. The political aspiration of creating EU alternatives remains unfulfilled.

In this interview, Bonfiglio explains what was achieved, what fell short of expectations and how cloud be done differently. He outlines why he is still optimistic Europe can offer something different in the world's cloud computing industry.

Bonfiglio's answers have been abbreviated for clarity and length.

What were your expectations for Gaia-X when you became chief executive of the association?

The ambitions of Gaia-X were big, but the clarity on the scope was not shared across all members. Everybody was projecting into Gaia-X their own, at times very different, hopes on how Europe can regain digital sovereignty: some wanted it to be an EU hyperscaler, others wanted it to lobby policymakers for US player market restrictions, some others wanted it to be a formal body of standard to define compulsory rules for Europe and thus reduce the freedom and super power of the non-EU data platforms providers.

The strategy we agreed on when I was selected as chief executive in 2020 was simple.

The goal was the creation of a trusted, federated and hyper-distributed cloud infrastructure to transform the weakness of European providers' fragmentation and limited capacity, into a cumulative strength for competitive advantage in the market.

What could Europe offer to separate itself from what was already offered by others?

Many believe European cloud service providers cannot keep up with their competitors in terms of innovation, capacity, and scalability. Also, at a political level, many believe Europe has lost the battle of cloud. I think such generic statements are incorrect and misleading. In fact, most private and public business do not require the kind of unlimited scalability offered by hyperscalers. and moreover, the low cloud uptake in Europe is due to lack of trust, not due to lack of capacity. No individual European company can offer the portfolio of services, capacity, and territory coverage to equal any hyperscaler, but the federation of them could. The goal should not be to simply grow capacity through aggregation, but to implement a completely different model of systolic, distributed, decentralized, interoperable, and trustworthy services.

American companies dominate the global cloud computing market. What was the plan for Gaia-X to compete?

Everyone still hopes for a true European alternative. But we must be realistic. While infrastructure-as-a-service can be replaced by European companies, many of the platform-as-a-service offerings are largely dominated by non-European players. In the 'collaboration' world (email, file-sharing, video-conferencing, messaging platforms or applications), the dominance of Microsoft O365 is total because everything is integrated into a single package.

Pulling together existing EU alternatives, licensed (like NextCloud) or OSS (like LibreOffice) in a platform that offers true service composition, avoiding any effort or hassle by the customer, is possible and could trigger at least some market changes.

A federated approach to cloud computing requires three things. A strong endorsement by Europe's political institutions to enable adoption by European companies, a higher degree of freedom from the constraints of European competition and state aid law since we are operating in an environment that is already non-competitive and dominated by an oligopoly, and a deep review of the investment strategies adopted so far by Europe.

Many non-EU companies became involved in the Gaia-X project. Was that a mistake?
Opening the association to all was not an option. To be compliant with competition rules, it was necessary. I still believe it was the right thing to do because if you want to win in the market, you must do something new — beating, not excluding, competition.

That would have worked if we had created a hyper-distributed, federated, transparent, controllable and interoperable cloud network. The mistake was not in the inclusive approach, but instead in allowing external and internal lobbies to remove or dilute requirements, and de-focusing from the main objective of building a real federated cloud infrastructure.

The European Commission has made 'digital sovereignty,' and maximizing European data for socio-economic benefit, a political priority. How was Gaia-X supposed to fit into that aim?

The Commission was a strong believer in Gaia-X. But since Gaia-X was set up as an association, it could not take a clear position in mandating Gaia-X as a standard.

The priority was there, but there was never a common definition of what digital sovereignty means. In Gaia-X, we gave a clear definition of how this could be achieved. But there was not a clear definition from the Commission for what digital sovereignty means and how to achieve it in a deterministic way.

Years after the Gaia-X project began, the market share in cloud computing remains mostly unchanged. What went wrong with the European Union's ambitions?

Actually, the market share of EU providers has shrunk. Between 2017 and 2020, it fell from 26 percent to 10 percent, cumulatively.

Halfway through the EU's 'Digital Decade,' it is necessary to ask why this has happened, especially after billions of euros have been spent.

The fundamental problem is that European politicians replaced industry in defining 'how' to do things instead of focusing on 'what' needs to be done, and relying on experts in the European market. The other problem is that our competition laws force any deliverables produced with tax-payer money to be open to all, and not just to benefit European players of the European economy. This is a good rule - if we were in a fair competition environment and not hostage to a cartel of American lobbies.

If you had an opportunity to go back and change how Europe approached its efforts around cloud computing, what would your priorities be?

There is no point in going back. But if by going back, you mean restarting Gaia-X, I would create two legal entities: a think-tank to define the standard, and an operating company to develop and deliver services to the market.

The think tank would have working groups with specific release and deliverable plans. The company would be initially funded through a portion of the members' fees but would then be open to private and public investors.

Why is it important for Europe to offer an alternative to local businesses and governments compared to what is already in the cloud market?

Europe is recognized as the best producer of digital regulation. If we only managed to transform that into the development of a set of trustworthy services, these would address a huge demand and have a unique opportunity within the global market.

Every hyperscaler developed its own proprietary concept of 'sovereign cloud.' But no one is offering the level of interoperability, reversibility, and controllability that Europe's new generation of digital rules like the DMA, the DSA, or the AI Act are asking for. In that sense, compliance can be a competitive advantage for EU companies.

Europe can also become the frontrunner in a new generation of a federated, hyper-distributed model of cloud. Such infrastructure does not exist, and the market opportunity would be global. Finally, Europe can capitalize on the European enterprise data ecosystem.

What needs to happen for European cloud companies to compete on the global stage?

The EU needs to move from investments in R&D only, to develop a 'euro stack,' or a European federation of cloud service providers, or any sort of protection from digital colonization from American providers that is buying every single available square meter of data center capacity and gigawatt of energy, means there soon will be no future for Europe's digital economy.

How do you view a Europe-centric cloud computing market fitting into the current political priorities of the incoming European Commission, including the recent competitiveness analysis from former European Central Bank president Mario Draghi?

'Super Mario's' report has been interpreted in different ways. Some read it as a surrender declaration to American technological supremacy. Others read it as a call to radical action.

Two aspects of the cloud chapter caught my attention: a stronger support for aggregations, including federations, and the demand to reduce regulatory barriers for collaboration, including between US and EU players, for the common good.

My concern is that investments will continue to be spent in the same old way, which would be a disaster. The reality is that existing investments are still going in different, and fragmented directions, in ways that absorb all financial resources of EU member states. The growth of European players can happen faster, and more effectively through the creation of commercial and technical federations of existing providers that combine at once the need for hyper-distribution with interoperability when necessary.

XII. Toward Public Digital Infrastructure: From Hype to Public Value

by Dr. Zuzanna Warso

Following decades of a hands-off, neoliberal approach that relied on market forces to drive technological progress and digital industries to self-regulate, there is now growing recognition in EU policy circles that governments must play a more active role in shaping digital markets. Amid a wave of digital regulation—including the Digital Services Act (DSA), the Digital Markets Act (DMA), and, most recently, the AI Act—the EU has taken steps to mitigate risks and harms in the digital economy and to improve the contestability and fairness of digital markets. But regulation alone cannot transform a digital economy characterized by corporate capture and technological dependency on a handful of mostly US-based companies. Any real transformation must be complemented by substantial investment in digital infrastructures.

The idea of digital public infrastructure (DPI) captures much of the current sentiment about what needs to be done to address some of the pathologies of digital markets. While the concept of DPI carries a lot of promise, its ambiguous and evolving nature also introduces challenges, chief among them the risk of forgetting that digitalization and "digital innovation" are not ends in themselves. As the discussion about new industrial policy in the EU unfolds and the idea of digital public infrastructure attracts the attention of European policymakers and civil society, these risks must be recognized and addressed. This requires shifting the focus from "digital" to "public" and moving away from the technosolutionist mindset that has shaped the EU's approach to digital innovation. Technosolutionism, which overlooks the complexities of human behavior and wide-ranging systemic issues, is characterized by the belief that technology alone can solve societal problems.

Over the past couple of years, various actors from the UN[209] to Mastercard[210] have championed digital public infrastructure. The concept of DPI has become influential due to the efforts of the Indian government and its work on digital identity, e-commerce, and payment systems.[211] India has conceptualized DPI as open and interoperable technologies that facilitate essential functions for the delivery of public services. A closer look at the idea of DPI reveals that its proponents speak of an array of technological components and areas of desired intervention. While the Indian Stack is a major source of inspiration for advocates of DPI, there are alternative ways of framing the demand for digital infrastructure that serves the public. In our work, we identified several other approaches to digital public infrastructure.[212] Notably, Ethan Zuckerman defined it as "infrastructures that let us engage in public and civic life in digital spaces."[213] For him, key components of digital public infrastructure include social media networks, discovery tools, and revenue systems. Another important contribution to the debate on digital infrastructures championed by the Sovereign Tech Fund funded by the German government[214] is one that highlights the need to safeguard the resilience of the open-source layers within the internet stack to withstand disruptions such as security threats, technical failures, or attempts to limit openness. A strong emphasis on the openness of online resources also guides the work of the Digital Public Goods Alliance.[215] A looming question in the discussion on DPI is whether it should only encompass the immaterial (i.e., purely digital) components of the internet stack, such as protocols or software; or also reach deeper, physical layers.

While a certain ambiguity around digital public infrastructure helps bring together under the same banner a bigger coalition of stakeholders, it also creates challenges. For example, whether we refer to the internet stack's material or immaterial layers affects the investment scale needed. Related to that, approaches that only look at the application layer run the risk of ignoring structural dependencies and concentration of power at the deeper levels of the stack. More fundamentally, however, the ambiguity might conceal the fact that the priorities of those implementing DPI do not align. In the past, this risk manifested itself, for example, in the case of India's Aadhaar, the world's largest biometric

[209] "Digital Public Infrastructure," United Nations Development Programme (UNDP), accessed September 25, 2024, https://www.undp.org/digital/digital-public-infrastructure.

[210] "Good Connections: How DPI Drives Global Inclusion and Innovation," *Financial Times* (Mastercard Partner Content), accessed September 25, 2024, https://www.ft.com/partnercontent/mastercard/good-connections-how-dpi-drives-global-inclusion-and-innovation.html.

[211] "About Us," Global DPI Repository (GDPIR), accessed September 25, 2024, https://www.dpi.global/home/aboutus.

[212] Jan Krewer and Zuzanna Warso, "Digital Commons as Providers of Public Digital Infrastructure," Open Future, June 30, 2024, https://openfuture.pubpub.org/pub/digital-commons-public-digital-infra/release/2.

[213] Ethan Zuckerman, "What Is Digital Public Infrastructure?" Center for Journalism and Liberty, November 2020, https://static1.squarespace.com/static/5efcb64b1cf16e4c487b2f61/t/5fb41b6aac578321b0c50717/1605639019414/zuckerman-digital-infrastructure-cjl-nov2020.pdf.

[214] "Strengthening Digital Infrastructure and Open Source Ecosystems in the Public Interest," Sovereign Tech Fund, accessed September 25, 2024, https://www.sovereigntechfund.de.

[215] "Unlocking the Potential of Open-Source Technologies for a More Equitable World," Digital Public Goods, accessed September 25, 2024, https://digitalpublicgoods.net.

ID system, which faced criticism regarding security, privacy, exclusion of vulnerable citizens from public services, and the exploitation of data.[216] This challenge becomes particularly acute when efforts around DPI focus too much on technical issues and less on the social embeddedness of technologies, turning digital innovation into an end in itself.

To avoid this pitfall and to differentiate from some of the narrower definitions of DPI[217] that concentrate on a selected number of services, we prefer to use the term "**public digital infrastructure**."[218] This concept describes digital infrastructure designed to maximize public value by combining public attributes (unrestricted access enabled by openness and interoperability) with public functions (social and economic functions that empower and support people and institutions, including governmental bodies but also institutions like libraries and museums) and public ownership (government or civic participation in the production, funding, and control of the infrastructure). The intention of this complex unpacking of what "public" means, inspired by Mariana Mazzucato's work,[219] is to shift the focus of the debate from the technical aspects of infrastructure (i.e., making things digital) to its social relevance (i.e., making things public). Maximizing public value is essential, especially in today's context, where an ambitious industrial policy that EU policymakers are planning to pursue could further exacerbate the dangers of a technosolutionist approach to innovation. The concern is that the EU will funnel resources into solutions shrouded by hype and adopt an "arms race" mentality around certain digital technologies, AI in particular.[220] This would be the worst possible outcome of recognizing and acting on the need for a more active role of the state in shaping the digital economy.

Rather than fixating on speculative future needs, such as virtual worlds or "Internet 4.0,"[221] the EU must address its dependencies on digital infrastructures provided by the US-based hyperscalers who operate their own services on top of their infrastructures. The priority should be supporting a sustainable digital environment that puts people in control and allows them to flourish and enjoy their rights online.[222] Europe needs alternatives to Big Tech systems, including but not limited to cloud, online platforms, app stores, social media, collaborative and communication tools, advertising infrastructure, and so on. Such

[216] See Reetika Khera, ed., *Dissent on Aadhaar: Big Data Meets Big Brother* (Hyderabad: Orient Blackswan, 2019), https://orientblackswan.com/details?id=9789352875429.

[217] "Mapping Digital Public Infrastructure," DPI Map, Institute for Innovation and Public Purpose, accessed September 25, 2024, https://dpimap.org.

[218] "Public Digital Infrastructure," accessed September 25, 2024, https://openfuture.eu/our-work/public-digital-infrastructure.

[219] David Eaves, Mariana Mazzucato, and Beatriz Vasconcellos, "Digital Public Infrastructure and Public Value: What Is 'Public' about DPI?" Working paper, Institute for Innovation and Public Purpose, University College London, 2024–25, "https://www.ucl.ac.uk/bartlett/public-purpose/sites/bartlett_public_purpose/files/iipp_wp_2024-05.pdf.

[220] AI Now Institute, "Tracking the US and China AI Arms Race," April 11, 2023, https://ainowinstitute.org/publication/tracking-the-us-and-china-ai-arms-race.

[221] Paul Keller, "Europe's Digital Infrastructure Needs: Consultation Response," Open Future (blog), July 3, 2024, https://openfuture.eu/blog/europes-digital-infrastructure-needs-consultation-response.

[222] Zuzanna Warso, "Digital Rights Revisited: A Rights-Based Approach to Building Digital Public Spaces," Open Future, October 17, 2023, https://openfuture.eu/publication/digital-rights-revisited.

alternatives should not simply replicate the "foreign" big-tech paradigm. Instead, they should be based on collective governance and nonextractive economic models.[223]

Creating these alternatives will only be possible by first understanding why past projects aimed at "digital sovereignty" have failed.[224] So far, Europe's approach to supporting public digital infrastructure has been fragmented across different funding mechanisms, many of which, including the flagship Horizon Europe and Digital Europe programs, follow an innovation-driven and project-based model, often providing only short-term funding that is poorly suited to sustainable infrastructure maintenance.[225]

This approach to funding PDI needs an overhaul. If the EU is serious about "tech sovereignty,"[226] it must confront, through strategic investment, the fundamental mismatch between the interests of a small number of US and China-based corporations on one hand, and the health of European democracies on the other. Europe must move beyond its technosolutionist and fragmented approach and adopt a holistic strategy for public digital infrastructure. Without taking this step, it will never be an independent and sovereign player in the digital economy, but will simply remain a playground for Big Tech.

---

[223] Alek Tarkowski and Paul Keller, "Generative Interoperability: Building Public and Civic Spaces Online," Open Future, March 11, 2022, https://openfuture.eu/publication/generative-interoperability.

[224] Jan Krewer, "Draghi's Plan: Rewriting or Repeating EU Tech History," Open Future (blog), September 13, 2024, https://openfuture.eu/blog/draghi_rewriting_or_repeating_eu_tech_history.

[225] See Lee Vinsel and Andrew L. Russell, *The Innovation Delusion: How Our Obsession with the New Has Disrupted the Work That Matters Most* (New York: Penguin Random House, 2020); and Lee Vinsel, "The Innovation Delusion," accessed September 25, 2024, http://leevinsel.com/the-innovation-delusion.

[226] See Ursula von der Leyen to Henna Virkkunen, "Mission Letter," September 17, 2024, https://commission.europa.eu/document/download/3b537594-9264-4249-a912-5b102b7b49a3_en?filename=Mission%20letter%20-%20VIRKKUNEN.pdf.

Contributor Bios

Cecilia Rikap

Cecilia Rikap is the Head of Research and an Associate Professor in Economics at the University College London's Institute for Innovation and Public Purpose. She is a tenure researcher of the CONICET, Argentina's national research council, and associate researcher at COSTECH lab, Université de Technologie de Compiègne. Cecilia's research is rooted in the international political economy of science and technology and the economics of innovation. She studies the rising concentration of intangible assets leading to the emergence of intellectual monopolies among others from digital and pharma industries. Her research highlights the unequal distribution of intellectual (including data) rents and the effects of intellectual monopolization on the knowledge commons, development and rising geopolitical tensions. Her most recent work includes a focus on artificial intelligence and the cloud, Big Tech dominance of these technologies and their interplay with other multinational corporations. She is the author of the award-winning book _Capitalism, Power and Innovation: Intellectual Monopoly Capitalism Uncovered_ and co-author of _The Digital Innovation Race_.

Cristina Caffarra

Cristina Caffarra is an expert economist who has led large antitrust advisory practices in Europe for 20 years, appearing as witness in multiple high-profile cases before the courts in several jurisdictions, and advising on landmark matters before the EC and other agencies (across Europe as well as Australia, South Africa, the Middle East, South East Asia and the US) - on behalf of both governments and clients. She is recognised as a thought leader in the regulation of the digital economy globally, advising companies but also regulators. She is a frequent public speaker and regularly presents at top events on competition, regulation and digital policy. She is also a convener gathering senior agency, policy and academic speakers for the most high-profile events in Europe on competition, regulation, and digital policy. She has written multiple contributions to the field of competition and regulation of digital markets, trade and industrial policy, lectures in competition

economics as an Honorary Professor at UCL, and is also Associate Fellow of the Centre for Economic and Policy Research (CEPR) in London, Co-Founder of CEPR's Competition Research Policy Network

Fieke Jansen

Fieke Jansen is the co-founder of the Critical Infrastructure Lab and a postdoctoral Researcher at the University of Amsterdam. She also coordinates the Green Screen Climate Justice and Digital Rights Coalition.

Michelle Thorne

Michelle Thorne is working towards a fossil-free internet as the Director of Strategy at the Green Web Foundation. She's a co-initiator of the Green Screen Coalition for digital rights and climate justice and a visiting professor at Northumbria University. She served 12 years at the Mozilla Foundation, where she was Mozilla's first Sustainable Internet Lead and earlier the director of the Mozilla Festival and co-lead of the Marie Skłodowska-Curiea Doctoral Network on Open Design of Trust Things (OpenDoTT). Michelle publishes Branch, an online magazine written by and for people who dream about a sustainable internet, which received the Ars Electronica Award for Digital Humanities in 2021. Prior to Mozilla, Michelle managed the Creative Commons international affiliate network from 2007-2010.

Sarah Chander

Sarah Chander is an advocate and organizer working within racial and migrant justice, feminist and queer movements. Sarah is Director of the Equinox Initiative of Racial Justice, a queer, racialised led organization with a vision for creating societies of care and protection. Equinox works to shift policies and resources in the European Union away from policing, punishment, borders and surveillance and toward systems protection and social provision. Equinox is a coordinator of the Protect Not Surveil Coalition, working to contest harmful digital surveillance practices in policing and migration control. Previously, she led civil society advocacy on the EU Artificial Intelligence Act, working with a coalition of over 150 civil society organizations to call for the EU AI Act to better protect people and human rights.

Seda Gürses

Seda Gürses is an Associate Professor at University of Technology Delft, in the Netherlands. She is a founding member of The Institute for Technology in the Public Interest (TITiPI), a trans-practice gathering of activists, artists, engineers and theorists initiated by Myriam Aouragh, Helen Pritchard, Femke Snelting and herself. Her research and teaching in and around the Programmable Infrastructures Project (PIP) focuses on studying how software production in current day computational infrastructures came to be and where it is going. Previously she has worked at the intersection of privacy and requirements engineering. This article is part of an ongoing collaboration between Equinox, TITiPI and PIP that aspires to weave together questions of racial, economic and environment justice into questions of tech justice. This article is part of an ongoing collaboration between Equinox, TITiPI and PIP that aspires to deepen analyses within technology policy and connect questions of political economy, racial and environmental justice into digital debates.

Margarida Silva

Margarida Silva conducts research on the political and market power of Big Tech at the Centre for Research on Multinational Corporations (SOMO). Before joining SOMO she researched and campaigned against the political influence of Big Tech and other corporate sectors over EU policy-making at Corporate Europe Observatory. Margarida holds a Master's Degree in Political Communication from Goldsmiths, University of London, and a Bachelor's in Communication Sciences, specialized in Journalism, from the Universidade do Porto.

Jeroen Merk

Jeroen Merk is the Network Coordinator & Researcher, GoodElectronics at SOMO. He is a labor and human rights expert, with extensive knowledge of the supply chains of clothing, footwear and electronics. He obtained a PhD in international relations from the University of Sussex, Brighton (2009), followed by research positions at the London School of Economics and the University of Edinburgh. In the past, he was involved as research and policy coordinator at the international office of the Clean Clothes Campaign (CCC), a global network of labor rights advocates and anti- sweatshop activists. At CCC his involvement included campaigns for living wages and corporate accountability.

MEP Kim Van Sparrentak

Kim van Sparrentak is an elected Member of the European Parliament for the Dutch delegation of the Greens in the European Parliament (GroenLinks-PvdA), where she works on digital and social issues within the IMCO and EMPL committees. She was a shadow-rapporteur for the AI act and rapporteur for the report on Addictive Design.

Simona de Heer

Simona is Head of Policy and Digital Policy Advisor for the Dutch delegation of the Greens in the European Parliament (GroenLinks-PvdA). She studied law at Utrecht University and the University of Cambridge and specialized in fundamental rights and tech policy during her EU Law Masters in Utrecht. As advisor to Member of the European Parliament Kim van Sparrentak she worked on the EU's AI Act and the European Parliament report on addictive design of online services. She was also involved in the Digital Services Act and Digital Markets Act.

Burcu Kilic

Burcu Kilic is a senior fellow at the Center for International Governance Innovation (CIGI) and a tech and human rights fellow at the Carr Center for Human Rights Policy at the Harvard Kennedy School. She has worked with a diverse range of organizations across civil society, philanthropy, and academia. Her research and writings cover tech policy, intellectual property, and trade, and she has provided technical advice and assistance in countries across Asia, Latin America, Europe, and Africa. As the former head of policy at Frontier Technology—a Minderoo Foundation initiative—Burcu shaped the organization's approach to emerging technology, championing responsible, equitable, and just solutions. Before joining Minderoo, she directed the Digital Rights Program at Public Citizen, a non-profit consumer advocacy organization in Washington, DC, and also led their research on access to medicines. Her influence in tech policy, intellectual property, and trade underscores her commitment to policy entrepreneurship and rights-based advocacy. In 2015, she was recognized as one of the 300 Women Leaders in Global Health for her work on health and trade policy. From 2021 to 2022, she was a practitioner fellow with the Digital Civil Society Lab at Stanford University. Burcu completed her Ph.D. at Queen Mary University of London and holds LL.M. degrees in intellectual property law from Queen Mary

University of London and information technology law from Stockholm University. She obtained her law degree from Ankara University, Turkey.

Udbhav Tiwari

Udbhav Tiwari is the Director of Global Product Policy at Mozilla and co-leads Mozilla's AI Policy work. He was a former Non-Resident Scholar at Carnegie Endowment for International Peace, India and was an Advisory Council Member of the Digital Equity Accelerator by the Aspen Institute. He has been quoted as an expert in various international and domestic outlets, including CNN, The Guardian, Wired UK, Financial Times, BBC, Reuters, and the Times of India. He was also a part of India Today's 'India Tomorrow' list in 2020.

Francesca Bria

Francesca Bria is an innovation economist specializing in the intersections of technology, geopolitics, economy, cities, and society. She is an Honorary Professor at the Institute for Innovation and Public Purpose (IIPP) at UCL in London and a Fellow at Stiftung Mercator. Francesca serves on the High-Level Round Table for the New European Bauhaus, established by European Commission President Ursula von der Leyen to accelerate the EU Green Deal. Previously, she was President of the Italian National Innovation Fund and a member of the Executive Board of the Italian public media company RAI.

From 2015 to 2019, Francesca served as Chief Digital Technology and Innovation Officer for the City of Barcelona, where she led the city's Smart City Agenda and co-founded the United Nations Cities Coalition for Digital Rights. She initiated DECODE, the EU's flagship project on data sovereignty, and serves as a Senior Adviser for the European Commission's STARTS programme, which fosters innovation at the intersection of science, technology, and the arts.

Francesca has lectured at universities in the UK and Italy and advised governments, as well as public and private organizations, on technology and innovation policy, focusing on socio-economic, geopolitical, and environmental impacts. She has been recognized as a Commander of the Order of Merit of the Italian Republic and was listed among the Top 50 Women in Tech by Forbes Magazine. Additionally, she was named Culture Person of the Year 2020 by Frankfurter Allgemeine Zeitung (FAZ) and recognized as one of the world's

top 20 most influential figures in digital government by Apolitical, as well as one of the 28 power players behind Europe's tech revolution.

Mark Scott

Mark Scott is a senior resident fellow at the Atlantic Council's Digital Forensic Research Lab's Democracy + Tech Initiative where he leads on the think tank's digital policy work. Previously, he was POLITICO's chief technology correspondent and has worked at the New York Times and Bloomberg Businessweek. Alongside his affiliation with the Atlantic Council, he is a research fellow at the Hertie School in Berlin.

Francesco Bonfiglio

Francesco Bonfiglio is an Italian expert in digital transformation and data economy. From 2020 to 2023, he served as CEO of the Gaia-X initiative, which supports the European Data Strategy and defines the concept of Digital Sovereignty. Under his leadership, a comprehensive strategic framework was established, fostering a large community of technology providers and users. Since 2024, Francesco Bonfiglio is the CEO of Dynamo, a new company co-founded by Aruba and Diagrammatica (Francesco's own company) to bring about the vision of a one-stop-place for Sovereign and Innovative Cloud Solutions, grouping exclusively European Cloud and Solutions Providers. With over 30 years of experience in IT and consulting, he has held leadership positions at Engineering D.HUB, was Vice President of Confindustria Valle D'Aosta, and mentored multiple startups. Francesco also held executive roles at HP, Avanade, Unisys, and Rational Software. He believes in the power of collective intelligence, lateral thinking and teamwork as a propeller for transformation, in business as well as in life!

Zuzanna Warso

Zuzanna has over ten years of experience in human rights research and advocacy. Her work focuses on the intersection of science, digital technology, human rights and ethics. She is a research director at Open Future and a fellow at the Critical Infrastructure Lab. Since 2019, she has been an independent expert for the European Commission, where she participates in the ethical monitoring of EU-funded research and innovation projects. Zuzanna holds a PhD in International Law from the University of Warsaw. She passed the

bar exam in April 2017, and served as the vice-president of the human rights section of the Warsaw Bar Association. She is a member of the Women's Rights Group of the Polish Bar Council.

Methodology for EU AI Startup Market Analysis

The exact commitments of individual funders is not public. To estimate the commitments of individual funders, we analyze each funding round (e.g., Seed, Series A, Series B, Series C) of a target company using data from FactSet research. For the value of each funding round R, we distribute the total sum equally among all participating investors N, and by summing these values across all rounds, we estimate the total investment F by each funder j in the target company.

A limitation of this methodology is the assumption of equal contribution among investors participating in a round, which may underestimate the influence of lead investors while overstating the contribution of follow-on investors. As a result, the funding structure is assumed to be more polarized than this model suggests. Typical estimates suggest that the lead investor might commit up to 20–50 percent of a particular round. For visual clarity, the visualization also excludes investments from regions with only minor stakes in the EU companies.

For the compute infrastructure, we traced the compute providers of the startups from public sources and then explored what hardware infrastructure the respective compute providers use. The key limitation of this methodology is the lack of information of the relative weight of the different chips in computing clusters in the case of several providers. Moreover, companies might have further, alternative compute providers for which information is not available. Considering the path dependencies between hardware and the large scale AI models, we do expect these potential missing compute providers to use the same hardware as other compute providers of a target company.

The funders were located geographically on the basis of the location of primary headquarters, and the classification of investor types was done based on the contextual information about the nature of the company.

Source Data EU AI Startup Market Analysis

Company name	Type of AI	HQ location	Year of founding	Amount of VC capital raised before 09/2024 (USD M)	Estimated valuation (USD 09-2024) M)
Mistral AI	GenAI/LLM	FR	2022	1054	6296
Helsing	ML	GER	2021	824	5307
DeepL	GenAI/Translation	GER	2009	500	2000
Owkin	Gen AI/Medical	FR	2021	241	1000
SiloAI	GenAI/LLM	FI	2017	10	665*
Photoroom	GenAI/Image Editing	FR	2019	62,52	500
Aleph Alpha	GenAI/LLM Platform	GER	2018	260	490
Nabla	GenAI Finetuning	FR	2018	69.47	180
H	RL/Agent Models	FR	2024	220	N/A
Black Forest Labs	GenAI/Image Generation	GER	2024	31	N/A
Dust	GenAI Finetuning/Knowledge Management	FR	2024	21.54	N/A

*Acquired by AMD in July 2024.

Acknowledgements