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ARTICLE

EU Environmental Law in the Digital Age: A Critical Outlook on the Twin Transition's Legal Structure

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Abstract

The European Union (EU) has embraced the "twin transition" – the simultaneous pursuit of digitalisation and ecological transformation – as a cornerstone of its industrial policy. EU lawmakers argue that digital technologies can advance environmental protection by enhancing environmental monitoring, optimising resource use, and enabling data-driven sustainability efforts. However, this vision tends to overlook the environmental costs of digitalisation, including rising energy and water consumption, intensive resource extraction, and the proliferation of electronic waste. This article critically examines whether EU law is adequately equipped to support a twin transition, drawing on a black-letter analysis of EU legal provisions, as well as insights from science and technology studies and critical environmental law. It posits that, while environmental law plays a significant role in the datafication of the environment and the digitalisation of society, it falls short in regulating digital technology and data in ways that advance sustainability. For the twin transition to evolve beyond a political slogan and deliver real ecological benefits, substantial legal reforms would be required. The regulation of digital technology would have to move beyond corporate self-regulation and disclosure-based models of environmental governance. Data governance should be reoriented to emphasise freedom of access and a more deliberatively restrained approach to data generation.

Keywords: Digitalization; Environmental Law; sustainability; technology; twin transition

Introduction

The 'twin transition' is the term commonly used to capture the perceived synergies between sustainability and digitalisation. While the concept is gaining traction globally, it has found particularly strong regulatory support in the European Union. Digitalisation and sustainability are not only considered the two pillars of the New Industrial Strategy for Europe;[1] the Commission further assumes that "Europe's digital transition goes hand in hand with the European Green Deal," stressing that neither can succeed without the other.[2] The European Parliament and the Council have also embraced this vision, adopting various legislative measures based on the assumption that digital technologies will

[1] European Commission, Communication on a New Industrial Strategy for Europe, COM/2020/102 final, 10 March 2020. See also: European Commission, A Digital Compass For 2030: Europe Points the Way to the Digital Decade, COM(2021) 118 final, 9 March 2021; The Clean Industrial Deal: A Joint Roadmap for Competitiveness and Decarbonisation, COM(2025) 85 final, 26 February 2025.

[2] European Commission, The European Digital Sector, at <https://digital-strategy.ec.europa.eu/en/policies/green-digital> (accessed 5 June 2025).

naturally advance environmental protection.[3] Throughout EU law and policy, digital infrastructures – including digital technologies[4] and the data they generate – are widely seen as key to improving environmental monitoring, strengthening climate prediction models, boosting resource efficiency, and ensuring compliance with environmental standards, all while opening up new economic opportunities.

However, the ecological toll of digital infrastructures is a source of increasing concern amongst environmental experts. These infrastructures are associated with significant levels of water consumption,[5] greenhouse gases emissions[6] and mining of critical minerals[7] – pressures that risk growing as exponentially as the surge in data consumption.[8] Large technology firms bet on further technological progress to bring down the record-high levels of resource extraction and pollution caused by digitalization.[9] However, environmental efficiency gains obtained thanks to further technological progress are generally offset by increasing consumption levels.[10] This "rebound effect" is a well-known limitation on the ecological effectiveness of technology-driven gains in environmental efficiency.[11] The risk that resource use and pollution levels will outstrip gains in environmental efficiency is even greater given that the very business model of large technology firms is "driving ever-increasing data processing and storage, content

[3] See, e.g., Art. 6 of Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013, OJ L 435 6.12.2021, p. 1.

[4] The term "digital technologies" designates information and communication technologies based on the coding of data in binary language, which build on "computer science, automation, robotics, signal and image processing, telecommunications and electronics, but [are] also related to mathematics or modeling" (François Jacq and Benoît Fauconneau "Numérique et Recherche Environnementale: Quelles Évolutions?" (2017) 87(3) Annales des Mines – Responsabilité et environnement, 76. There is thus a wide range of digital technologies, including communication, blockchain, artificial intelligence, the Internet of Things (IoT), digital terminals (such as smartphones ....).

[5] See, e.g., P Hacker "Sustainable AI Regulation" (2024) 61(2) Common Market Law Review, 345, 355; C Criddle and K Bryan, "AI Boom Sparks Concern Over Big Tech's Water Consumption – Microsoft, Google and Meta are Using More Water to Cool Down Data Centres that Power AI Products" *Financial Times* 25 February 2024 at <https://www.ft.com/content/6544119e-a511-4cfa-9243-13b8cf855c13> (accessed 15 September 2024).

[6] See, e.g., N Jones, "How to Stop Data Centres from Gobbling Up the World's Electricity" (2018) 561 Nature, 163; The Shift Project (TSP), Lean ICT: Towards Digital Sobriety, 2019, at <https://theshiftproject.org/wp-content/uploads/2019/03/Lean-ICT-Report_The-Shift-Project_2019.pdf> (accessed 15 September 2024); Hacker (n 5), 346–7; Joint Research Centre, Energy Consumption in Data Centres and Broadband Communication Networks in the EU (European Commission, 2024); M McCormick, J Smyth and A Chu, "AI Revolution Will Be Boon For Natural Gas, Say Fossil Fuel Bosses – Data Centres' Need for Reliable Power Supply Set To Soar" *Financial Times* 1 April 2024, at <https://www.ft.com/content/1f93b9b2-b264-44e2-87cc-83c04d8f1e2b> (accessed 5 June 2025) ; C Hodgson and S Morris, "Google Emissions Jump Nearly 50% Over Five Years As Ai Use Surges" *Financial Times* 2 July 2024, at <https://www.ft.com/content/383719aa-df38-4ae3-ab0e-6279a897915e> (accessed 5 June 2025).

[7] C Izoard, *La Ruée Minière au XXIe siècle : Enquête sur les Métaux à l'Ère de la Transition* (Éditions du Seuil 2024).

[8] A Goel, S Masurkar and GR Pathade "An Overview of Digital Transformation and Environmental Sustainability: Threats, Opportunities, and Solutions" (2024) 16(24) Sustainability, 11079.

[9] See, e.g., A Mooney and C Hodgson, "'Let's Not Go Overboard' on Worries About AI Energy Use, Bill Gates Says" *Financial Times* 27 June 2024, at <https://www.ft.com/content/68495f0d-4d35-4270-a33d-02e9e537460f> (accessed 10 June 2025). See also: T Le Goff "Environmental Law's Principles Applied to Artificial Intelligence: A Path Towards Regulation" (2025) International Review of Law, Computers & Technology, 1, 3-4 (noting that Google reports a 48% rise in its emissions between 2019 and 2024, while Microsoft's emissions have surged by 29% since 2020).

[10] Regarding energy consumption, see, e.g., S Lange and T Santarius, "Digital Reset: Redirecting Technologies for the Deep Sustainability Transformation," 2023 [Digitalization for Sustainability (D4S)], 75, at <https://digitalization-for-sustainability.com/digital-reset/> (accessed 10 June 2025). See more generally Jean-Baptiste Fressoz, *Sans Transition: Une Nouvelle Histoire de l'Energie* (Éditions du Seuil 2024).

[11] See, e.g., K Mathis "Sustainability Strategies and the Problem of the Rebound Effect" in K Mathis and BR Huber (eds.), *Energy Law and Economics* (Springer 2018), 3.

(and particularly video) streaming in real-time, and complex data analytics systems," all of which drive "a substantial increase in data collection and waste."[12]

Moreover, while digital technologies are often portrayed as tools for enhancing democracy, strengthening community life, and fostering more respectful relationships with nature, they can just as readily be used to suppress environmental activism,[13] entrench the market dominance of profit-driven corporations,[14] concentrate power and security in the hands of a small, highly digitalized elite,[15] and deepen human domination over nature.

Legal scholarship on this critical issue remains relatively limited, with most contributions emerging from the field of digital law. While often insightful, this body of work rarely engages with perspectives from Science and Technology Studies (STS) or critical environmental scholarship. As a result, it frequently treats terms like "sustainability" and "green transition" as self-evident. It thus fails to recognize – and building upon – the insight that data infrastructures actively shape and frame how these deeply contested concepts are understood, thereby entrenching the dominance of certain social groups, and of some "knowledges and sense-making practices while marginalizing others."[16] Moreover, this literature often assumes that expanding reporting obligations for tech firms will inherently drive environmental progress, without acknowledging decades of research indicating that the environmental track record of transparency schemes is inconclusive[17] – and potentially negative.[18] Conversely, environmental law scholars have largely neglected the twin transition, likely due to a prevailing scepticism toward technological optimism. As for STS scholars, they often overlook specific legal developments – offering insightful perspectives, yet failing to account for how these dynamics are shaped and sustained through legal engineering.[19]

Advancing research on the twin transition requires the integration of insights from legal analysis, critical environmental studies, and Science and Technology Studies. Such an interdisciplinary approach is particularly pressing. Technology has become a formal pillar

[12] E Bietti and R Vatanparast "Data Waste" (2020) 61 Frontiers, 1, 7.

[13] F Jansen et al., "The Climate Crisis is a Digital Rights Crisis: Exploring the Civil-Society Framing of Two Intersecting Disasters" *LIMITS* 14–15 June 2023, 1, at <https://assets.pubpub.org/c8fqrdwd/41686089243406.pdf> (accessed 15 September 2024); D. Głowacka et al. Digital Technologies As a Means of Repression and Social Control, Study for the European Parliament, Apr. 2021, at <https://www.europarl.europa.eu/RegData/etudes/STUD/2021/653636/EXPO_STU(2021)653636_EN.pdf> (accessed 14 September 2024).

[14] M Luyckx and L Reins "The Future of Farming: The (Non)-Sense of Big Data Predictive Tools for Sustainable EU Agriculture" (2022) 14(20) Sustainability, 1.

[15] See, e.g., JS Mankin, "The People Have a Right to Climate Data" *The New York Times* 20 June 2024, at <https://www.nytimes.com/2024/01/20/opinion/climate-risk-disasters-data.html> (accessed 10 June 2025); J Confavreux, "Les 'Travailleurs du Clic": Nouveaux Prolétaires du Numérique' *Mediapart* 10 January 2019, at <https://www.mediapart.fr/journal/culture-idees/100119/les-travailleurs-du-clic-nouveaux-proletaires-du-numerique> (accessed 10 September 2024); P Le Guern, "Robots, Élevage et Techno-Capitalisme : Une Ethnographie du Robot De Traite" (2020) 2 Réseaux, 253.

[16] L Mai "Measuring It, Managing It, Fixing It? Data and Rights in Transnational and Local Climate Change Governance" (2024) 13(1) Transnational Environmental Law, 111, 125. See also C Horn and U Felt "On the Environmental Fragilities of Digital Solutionism: Articulating 'Digital' and 'Green' in the EU's 'Twin Transition'" (2025) Journal of Environmental Policy & Planning, 1.

[17] A-S Epstein, *Information Environnementale et Entreprise : Contribution à l'Analyse Juridique d'une Régulation* (LGDG/Institut Varenne 2015).

[18] See, e.g., MH Doan and R Sassen "The Relationship Between Environmental Performance and Environmental Disclosure: A Meta-Analysis" (2024) 24 Journal of industrial Ecology, 1140–57.

[19] See however R Vatanparast "Algorithmic Environmentality: Data Infrastructures in Global Environmental Governance" in F Johns, G Sullivan and D Van Den Meerssche (eds.), *Global Governance by Data: Infrastructures of Algorithmic Rule* (Cambridge University Press, forthcoming), at <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4782798> (accessed 10 June 2025).

of environmental policy,[20] and digital infrastructures, in particular, merit critical examination. As scholars have observed, "data can shape imaginaries, define problems, create and 'translate' processes and phenomena that are represented in data, draw boundaries (i.e., what is valid and what is 'noise'), and embody normativities through choices around datafication (i.e., what becomes data), naming (i.e., what is being measured), standards (i.e., what becomes valid data), and modes of presentation (i.e., formats, visualizations, etc.)."[21] In this context, digital infrastructures appear to hold distinctive potential to not only deliver direct gains in ecological efficiency, but also to produce broader ecological co-benefits by reorienting behaviours and social norms.[22]

However, data infrastructures are not, by design, oriented toward delivering environmental benefits or fostering more respectful relationships with the natural world. Achieving such outcomes depends largely on the governance of these digital systems. Yet serious doubts remain as to whether EU law provides meaningful direction for aligning the development of digital infrastructures with sustainability goals. Existing technology regulations fall short in mitigating the environmental impacts of digitalisation, and current data governance frameworks offer little support for fostering more considerate interactions with nature.

I – EU Law's Limited Ability to Steer the Development of Digital Technologies Toward Sustainability

EU environmental law largely reflects an eco-modernist perspective, framing technological innovation as a solution to ecological challenges and limiting regulatory intervention so as not to hinder digital innovation.[23] This orientation is evident in the information and communication technology sector, where the EU demonstrates a clear preference for corporate self-regulation and disclosure-based mechanisms over substantive environmental requirements. As a result, digital technologies continue to expand with little assurance that their growth aligns with the EU's sustainability goals. Their ecological impacts remain weakly regulated, while existing environmental law frameworks frequently serve to facilitate – rather than govern – their growth.

[20] See, e.g., O Hailes and J Viñuales, "The Energy Transition at a Critical Juncture" (2023) 26 Journal of International Economic Law, 627; IPCC Working Group III, "Climate Change 2022: Mitigation of Climate Change," 2022, at <www.ipcc.ch/report/ar6/wg3/> (accessed 10 September 2024); V Byers Flatt, "Technology Wags the Law: How Technological Solutions Changed the Perception of Environmental Harm and Law" in R Brownsword, E Scotford and K Yeung (eds), *The Oxford Handbook of Law, Regulation and Technology* (Oxford University Press 2016) 1194, 1204–5.

[21] A Fisher, B Kingsbury and T Streinz "Sensoring the Oceans: The Argo Floats Array in the Governance of Science Data Infrastructures," NYU School of Law International Law and Justice Working Papers, IILJ Working Paper 2024/1, 5, at <https://www.iilj.org/publications/sensoring-the-oceans-the-argo-floats-array-in-the-governance-of-science-data-infrastructures/> (accessed 10 June 2025).

[22] Given the scale and urgency of the changes required to meet internationally agreed environmental targets, economic, legal, and technological transformations must occur in parallel. This tends to suggest that environmental law should not only regulate technological change but also harness its constitutive role in reshaping worldviews, identities, and values. See A-S Epstein "Environmental Law and Technology: A Research Roadmap" in J van Zeben and C Hilson (eds.), *Research Agenda for Environmental Law* (E. Elgar 2025) 233.

[23] Eco-modernisation is an environmental discourse positing that technology can make economic growth environmentally sustainable. It started gaining traction in the 1980s, and while it was "initially concerned mainly with re-engineering developed economies," it "eventually spread to other parts of the world." (John Dryzek "Discourses" in L Rajamani and J Peel (eds), *The Oxford Handbook Of International Environmental Law* (Oxford University Press 2021) 33, 37).

Limited Substantive Environmental Constraints

The EU is often portrayed as an interventionist regulatory power. However, its current focus on merely "minimising the environmental footprint" of the information and communication technology sector falls short of enabling this sector to make a meaningful, positive contribution to the EU Green Deal's goals.[24] In practice, the EU's regulatory approach to digital technologies reveals a marked ambition to *limit* regulatory pressure on economic actors.

This approach is evident in traditional EU environmental statutes, which are often ill-equipped to steer the development of digital technologies toward sustainability. Their limited effectiveness in addressing the environmental impacts of the digital sector highlights deeper structural weaknesses in EU environmental law.

The first weakness lies in limited effectiveness. For example, while the Water Framework Directive sets out broad preservation objectives, it lacks the specific enforcement tools needed to address the impact of digital technologies on water resources. This regulatory gap grants significant discretion to Member States, some of whom have adopted unreasonably lenient interpretations of their obligations.[25]

The second weakness of EU environmental law stems from its traditional emphasis on direct discharges of pollutants from identifiable, localised sources. In contrast, emissions of greenhouse gases from digital technologies are predominantly indirect – arising in large part from electricity use (so-called scope 2 emissions) and global supply chains (scope 3 emissions).[26] Data centres, for example, are highly energy-intensive but typically emit few greenhouse gases directly; their carbon footprint stems mostly from the electricity they use.

EU environmental law has evolved to address some of these impacts through regulatory frameworks that promote energy efficiency and encourage due diligence in managing sustainability risks across value chains. However, even these more recent legislative developments entail shortcomings.

One notable limitation is that the EU's emphasis on efficiency gains is not accompanied by meaningful efforts to reduce overall environmental harm. Instead, current European legislative frameworks continue to rely primarily on disclosure-based obligations and self-regulatory instruments.

For instance, the revised Energy Efficiency Directive introduces reporting requirements for data centres with a power demand exceeding 500 kW, mandating the publication of key environmental performance indicators.[27] While such measures might encourage energy efficiency, they are likely insufficient to curb the rising energy consumption of data centres.

Similarly, the Critical Raw Materials Regulation sets the target of meeting at least 25% of the EU's annual consumption of strategic raw materials through recycling.[28] However,

[24] Commission Staff Working Document, Implementation of the Digital Decade objectives and the Digital Rights and Principles Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Report on the state of the Digital Decade 2023, SWD/2023/570 final, para 2.3.6.

[25] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, OJ L 327, 22.12.2000, p. 1. See, e.g., J-V Maublanc "Les Autorisations de Captage et d'Irrigation, Outils de Gestion Quantitative de la Ressource en Eau ?" (2024) 8–9 Droit rural, Etude 11.

[26] See, e.g., Joint International Telecommunication Union/World Bank "Measuring the Emissions & Energy Footprint of the ICT Sector," 2024, at <https://documents1.worldbank.org/curated/en/099121223165540890/pdf/P17859702a98880540a4b70d57876048abb.pdf?utm_source=chatgpt.com> (accessed 5 June 2025).

[27] Directive (EU) 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955, OJ L 231, 20.9.2023, p. 1, Art. 12 and Annex VII.

[28] Art. 5 of Regulation (EU) 2024/1252 of the European Parliament and of the Council of 11 April 2024 establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending Regulations (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1724 and (EU) 2019/1020, OJ L, 2024/1252, 3.5.2024.

this ambition is not backed by concrete, enforceable obligations. Although Member States are expected to adopt measures to upgrade recycling technologies and encourage greater use of recycled content, applicable standards remain vague. More broadly, the Regulation leans heavily on disclosure-based duties rather than substantive ecological mandates.[29] Similarly, the only environmental duty placed on corporations by the AI Act consists in a reporting requirement.[30]

Overall, EU law also tends to postpone the adoption of binding environmental obligations,[31] favouring the promotion of voluntary initiatives instead. For instance, several frameworks encourage data centres to follow best practices outlined in the European Code of Conduct for Energy Efficiency – developed by the Joint Research Centre – or to participate in the EU's Environmental Management and Audit Scheme (EMAS). Similarly, the AI Act promotes self-regulation,[32] even allowing providers and deployers of AI systems to define their own codes of conduct.[33]

Another major shortcoming of recent legislative developments is their frequent reliance on the vague notion of "economic feasibility" to justify limiting regulatory mandates.

For example, the Energy Efficiency Directive encourages the reuse of waste heat from data centres, while making this conditional on its economic feasibility.[34] Similarly, the obligation imposed on developers of strategic critical raw material projects to "improve the environmental state of the affected sites after the end of exploitation, with a view to restoring the prior environmental state" in third countries applies only to the extent that it is deemed "economically feasible."[35] In the absence of clear guidance on how to define and assess economic feasibility, such standards grant Member States significant discretion in their implementation, which could undermine the intended environmental objectives.

This risk is also evident in the Ecodesign legislative framework, which subjects certain digital products – such as smartphones,[36] servers,[37] and computers[38] – to environmental performance criteria. Yet these standards are, by design, limited in ecological ambition. They must indeed be formulated so as not to compromise product affordability and industrial competitiveness.[39] Furthermore, industry stakeholders exert considerable

[29] Ibid., Art. 7, 8, 12, 28 and 31.

[30] N Alder, K Ebert, R Herbrich and P Hacker, "AI, Climate, and Transparency: Operationalizing and Improving the AI Act," 28 August 2024, at <https://arxiv.org/pdf/2409.07471> (accessed 10 September 2024); Le Goff (n 9).

[31] While these various legislative frameworks do not preclude the adoption of binding ecological performance standards, they often defer such measures until the European Commission publishes a report assessing current market practices. Although this approach may appear to reflect a sound, evidence-based policymaking strategy, it carries the risk of turning data collection into a delaying tactic – one that is increasingly difficult to reconcile with the urgency of the ecological crisis. See, e.g., Art. 44 of Regulation (EU) 2024/1252 (n 28), Art. 12 of Directive (EU) 2023/1791 (n 27), and Art. 112 of Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence and amending Regulations (EC) No 300/2008, (EU) No 167/2013, (EU) No 168/2013, (EU) 2018/858, (EU) 2018/1139 and (EU) 2019/2144 and Directives 2014/90/EU, (EU) 2016/797 and (EU) 2020/1828, OJ L, 2024/1689, 12.7.2024.

[32] Le Goff (n 9).

[33] See notably Art. 95 of Regulation (EU) 2024/1689 (n 31).

[34] Directive (EU) 2023/1791 (n 27), art. 26 and annex XI.

[35] Art. 7 of Regulation (EU) 2024/1252 (n 28).

[36] Commission Regulation (EU) 2023/1670 of 16 June 2023 laying down ecodesign requirements for smartphones, mobile phones other than smartphones, cordless phones and slate tablets pursuant to Directive 2009/125/EC of the European Parliament and of the Council and amending Commission Regulation (EU) 2023/826, OJ L 214, 31.8.2023, p. 47.

[37] Commission Regulation 2019/424 of March 15, 2019 laying down ecodesign requirements for servers and data storage products pursuant to Directive 2009/125/EC.

[38] Commission Regulation (EU) No 617/2013 of 26 June 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for computers and computer servers.

[39] Art. 15 of Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products, OJ L 285,

influence over the drafting of applicable standards through their participation in standardization bodies and formal consultation processes.[40]

Taken together, these measures reflect a broader regulatory trend – one that privileges procedural obligations and industry self-regulation over substantive and binding environmental requirements. This approach illustrates how environmental law remains primarily geared toward accompanying technological development while merely mitigating certain negative environmental externalities,[41] rather than proactively shaping the trajectory of technological change.[42]

Yet environmental law is far from technologically neutral. On the contrary, it plays a technology-forcing role by actively promoting the expansion of digital technologies.

2.The Role of Environmental Law in Fostering Digital Technologies

The growing prominence of green industrial policies has foregrounded the role of environmental law as a *driver* of technological development. This dynamic is not new. At least since the nineteenth century, environmental regulation has served to incentivise the adoption of cleaner technology.[43] The rise of the principle of sustainable development in the 1980s reinforced this trend, cementing the notion that sustainability depends on continuous green innovation.[44] This logic also permeates international law, which frequently includes obligations for technological capacity-building and technology transfer from developed to developing countries, positioning environmental progress as fundamentally tied to technological advancement.[45]

Within the EU, environmental law actively advances digitalisation by embedding digital technologies into regulatory frameworks. This trend is exemplified by the Industrial Emissions Directive, which defines acceptable pollution levels with reference to "best available techniques" (BAT)[46] – a category that increasingly includes digital solutions.[47] As digitalisation has become a key criterion in BAT determinations, compliance with environmental standards is increasingly tied to the adoption of digital technologies.

31.10.2009, p. 10; and art. 5 of Regulation (EU) 2024/1781 of the European Parliament and of the Council of 13 June 2024 establishing a framework for the setting of ecodesign requirements for sustainable products, amending Directive (EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC, OJ L 285, 31.10.2009, p. 10.

[40] The Directive mandates that the Commission consult various stakeholders, including industry representatives, SMEs, trade unions, and consumer organisations. It also presumes the compliance of harmonised standards with implementing regulations, recognising the key role of industry in the development of such standards. As the European Commission explains, European standardisation is a consensus-driven process led by market needs (European Commission, Key players in European Standardisation, at <https://single-market-economy.ec.europa.eu/single-market/european-standards/key-players-european-standardisation_en> (accessed 30 August 2024).

[41] J E Viñuales and J-F Mercure (2020), "Pathway to Reframing Environmental Law" (2020) 50(6) Environmental Policy and Law, 509.

[42] Epstein (n 22).

[43] F Jarrige and T Leroux, *The Contamination of the Earth: A History of Pollutions in the Industrial Age* (MIT Press 2020).

[44] L Reins "Legal Principles and Technology at the Intersection of Energy, Climate, and Environmental Law" in B Brożek, O Kanevskaia and P Pałka (eds), *Research Handbook on Law and Technology* (Edward Elgar 2023) 254.

[45] See, e.g., S Alam, "Technology Assistance and Transfers" in L Rajamani and J Peel (eds), *The Oxford Handbook of International Environmental Law* (Oxford University Press 2021) 956.

[46] Art. 3 of the Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions, OJ L 334, 17.12.2010, p. 17.

[47] Directive (EU) 2024/1785 of the European Parliament and of the Council of 24 April 2024 amending Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions and Council Directive 1999/31/EC on the landfill of waste, OJ L, 2024/1785, 15.7.2024.

While this shift may accelerate the digital transformation of European industry,[48] it does not inherently guarantee improved sustainability, as data-driven optimization can support both environmentally sustainable and harmful business models alike.[49]

A similar assumption underpins the Common Agricultural Policy (CAP), which equates sustainability with technological modernisation (so-called "precision agriculture").[50] The CAP supports sustainability by funding farm conversions to organic production and subsidising precision and digital farming equipment, placing both on an equal footing.[51]

More broadly, environmental law actively drives digitalisation through its procedural frameworks and growing dependence on environmental reporting, monitoring and verification obligations.[52] Whereas technological upgrades were once an implicit aspect of regulatory compliance, recent legislation now explicitly mandates digital implementation. For example, the 2024 Ecodesign Regulation requires producers to disclose environmental impacts via digital product passports.[53] The 2022 Corporate Sustainability Reporting Directive (CSRD) requires that companies publish sustainability reports in standardised electronic formats.[54] Under the 2023 Deforestation Regulation, companies must geolocate production plots and submit due diligence statements through government-operated digital platforms.[55] Similarly, the Common Agricultural Policy relies on digital parcel mapping to monitor compliance with hedgerow conservation requirements.[56] Taken together, these instruments illustrate how environmental law not only accommodates, but increasingly mandates digital infrastructures as tools of environmental governance.

Moreover, data generation appears increasingly as not just a tool to achieve an ecological goal, but as a goal in itself. The proposed Soil Monitoring Law illustrates this trend.[57] While it places an immediate, specific requirement on Member States to set up a system for monitoring soil health, the obligation to promote sustainable soil management practices is vague and deferred. As put by Hilson and Savaresi, this text "does not [. . .]

[48] On the technology-forcing role played not only by technological standards, but also by performance standards, see notably JB Wiener, "The Regulation of Technology, and the Technology of Regulation" (2004) 26 Technology in Society 483.

[49] R-J Aubin-Brouté, "Politique agricole commune - Données agricoles et nouveau modèle de mise en œuvre de la PAC : quelle transition numérique ?" (2023) 3 Droit rural, Dossier 18.

[50] Ibid.

[51] See, e.g., Recital 26 of the Preamble of Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013, JO L 435 du 6.12.2021, p. 1. Another example of the tendency to assimilate digitalisation and sustainability includes recent legislative efforts all over the EU to accelerate the development of digital projects – such as the construction of data centres – in the name of sustainability. For a French example, see notably the Bill on the simplification of economic life of 24 April 2024, at <https://www.senat.fr/leg/pjl23-550.html> (accessed 15 August 2024).

[52] Epstein (n 17), 718 ff.

[53] Regulation (EU) 2024/1781 (n 39).

[54] Art. 29d of the Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting, OJ L 322, 16.12.2022, p. 15.

[55] Art. 9 and 28 of the Regulation (EU) 2023/1115 of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010. See also Art. 33 of this Regulation, which mandates Governments to establish an information system in order to track compliance and to facilitate administrative cooperation between competent authorities.

[56] Léo Magnin, *La Vie Sociale des Haies : Enquête sur l'Écologisation des Mœurs* (La Découverte 2024).

[57] Proposal for a Directive of the European Parliament and of the Council on Soil Monitoring and Resilience, COM(2023) 416 final, 5 July 2023.

impose an obligation of result on Member States to achieve healthy soils, nor does it require them to create any new programs or soil health plans. Rather, it seems designed to 'proceduralize' regeneration, by means of the introduction of indicators and data and an obligation to report to the Commission."[58] This points to a possible bureaucratic drift in EU environmental law.

The fact that the sustainability impact of this regulatory push toward digitalisation remains unexamined is another cause for concern, especially considering the significant toll digital infrastructures take on ecosystems, and the distributive effects of increasing reliance on digital technology.[59] Not only is the ecological impact of EU law provisions promoting digitalisation overlooked, but the risk that these provisions exacerbate power imbalances – favouring large public and private organizations with the resources to invest in advanced monitoring and compliance infrastructures[60] – is also largely ignored.

In the same vein, EU regulatory frameworks on environmental data appear ill-equipped to support ecological transformation.

II- EU Law's Failure to Govern Environmental Data to Support Ecological Transformation

The European Union increasingly views the expansion of data flows as a tool to enhance environmental protection, operating under the belief that more data will fuel the innovation needed to mitigate environmental harm. In parallel, environmental governance has come to rely heavily on reporting and disclosure mechanisms, premised on assumptions about the environmental value of market-based governance arrangements, corporate reflexivity, stakeholder pressure, and the civilising power of transparency. However, in practice, data holders retain significant control over the data they generate and disclose, which can undermine the environmental effectiveness of disclosure-based governance strategies. Moreover, the substance of current environmental data disclosure requirements falls short of promoting a data-driven shift toward more synergistic relationships with nature.

1. The Enclosure of Environmental Data

Just as there is a risk that the sustainability agenda is used as a pretext to accelerate digitalisation, there is also a danger that the growing emphasis on the role of data in environmental protection could paradoxically usher in a new era of environmental data enclosure.

To grasp this risk, it is important to understand that both environmental and digital law include extensive provisions on data governance. However, these frameworks remain largely uncoordinated.[61] This lack of integration is problematic, as the two fields often

[58] Chris Hilson and Annalisa Savaresi "Regenerative Approaches and Environmental Law: Beyond Sustainability?" in Josephine van Zeben and Chris Hilson (ed.) *A Research Agenda for Environmental Law* (E. Elgar, 2025), 59, 66.

[59] Legislative impact assessments shed little light on the environmental costs of the digitalisation needed to comply with new environmental regulations. See, e.g., Commission Staff Working Document, Impact Assessment Accompanying the Proposal for a Regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC, 30 March 2022, 46.

[60] See, e.g., Mai (n 16) 125.

[61] M Finck and M-S Mueller, "Access to Data for Environmental Purposes: Setting the Scene and Evaluating Recent Changes in EU Data Law" (2023) 35 Journal of Environmental Law 109.

regulate the same types of data while relying on different – and at times conflicting – assumptions about the legal status of data and the rules governing its communication.

EU environmental law generally treats environmental data as a public good, essential for transparency, ecological accountability, and informed environmental decision-making in the public interest.[62] Recognising that most corporations are unlikely to voluntarily produce or disclose such data, environmental law imposes mandatory disclosure obligations. These are intended to support evidence-based policymaking, strengthen regulatory enforcement, raise public awareness of environmental damages, and foster more participatory forms of environmental governance. This approach is anchored in the Aarhus Convention[63] and its implementing EU legislation,[64] which enshrine the public's right to access environmental information, conceived as a cornerstone of environmental justice and democracy. These legal instruments aim to empower civil society actors to safeguard themselves from environmental harm and to play an active role in shaping and enforcing environmental law.

While traditionally focused on public authorities, the environmental right-to-know of the public is increasingly being extended to private entities.[65] This extension reflects the growing reality that corporations define their own environmental policies – often beyond the reach of public oversight. It also confirms that access to environmental data should depend not on who holds the data, but on data's relevance to collective decision-making and the public interest. In this vein, the current emergence of a right to access environmental data held by private actors has the potential to enhance corporate accountability for environmental impacts, and to pave the way for more participatory forms of private environmental governance.[66]

Recent developments in European digital law – such as the Data Act[67] and the Data Governance Act[68] – reflect a markedly different approach to data governance. While these instruments grant users rights to access and port data generated through their use of connected products (such as IoT devices) and related services, they are fundamentally grounded in the view of data as a valuable economic asset. Both laws are shaped by the belief that data drives innovation and economic growth. Unlike environmental law, these instruments do not impose obligations on companies to generate or disclose data. Instead, they operate on the assumption that companies are *natural producers* of data and should only be incentivised to *share* the data they generate. To this end, these laws grant data holders extensive control rights, aiming to foster voluntary data sharing by protecting the commercial interests of data producers. As the legal framework has shifted toward enabling companies to monetise their informational assets, efforts to promote open access have slowed.[69]

[62] A-S Epstein "Le droit à l'information" in J Rochfeld, M Cornu and GJ Martin (eds.), Echelle de communalité : Propositions de réforme pour intégrer les biens communs en droit, Rapport pour la Mission Droit & Justice du Ministère de la Justice, 2021, 342, at <https://www.gip-recherche-justice.fr/publication/lechelle-de-communalite/> (accessed 15 May 2024).

[63] UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters of 25 June 1998 (hereafter the "Aarhus Convention").

[64] See notably the Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC, OJ L 41, 14.2.2003, p. 26.

[65] See notably the Directive (EU) 2022/2464 (n 54) and the Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859, OJ L, 2024/1760, 5.7.2024.

[66] Epstein (n 62); Joshua Galperin "Governing Private Governance" (2024) 56 Arizona State Law Journal 765.

[67] Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act), OJ L, 2023/2854, 22.12.2023.

[68] Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), OJ L 152, 3.6.2022, p. 1.

[69] SG Verhulst, "Are we entering a Data Winter? On the urgent need to preserve data access for the public interest" Frontiers, at <https://policylabs.frontiersin.org/content/commentary-are-we-entering-a-data-winter>

The Data Act places significant restrictions on third-party access to data,[70] allowing data holders to opt into greater openness only through the voluntary mechanism of "data altruism." The Data Governance Act defines "data altruism" as "the voluntary sharing of data on the basis of the consent of data subjects to process personal data pertaining to them, or permissions of data holders to allow the use of their non-personal data without seeking or receiving a reward that goes beyond compensation related to the costs that they incur where they make their data available for objectives of general interest [. . .]."[71] Data collected under this framework is intended to feed into the European Data Spaces, where the European Commission seeks to pool large sets of accessible data in domains of public interest, including environmental protection. However, "[e]xperience in data law so far has [. . .] shown the limited reach of individual rights the realisation of which is dependent on personal initiative."[72] Moreover, profit-oriented businesses are poised to be hesitant to participate, citing insufficient incentives to offset the burdensome and costly nature of the data altruism process.[73]

EU digital law even places limits on the ability of *public authorities* to request information from companies. The Data Act makes compulsory communication of information to the government an exception, providing for instance that "[w]here a public sector body, the Commission, the European Central Bank or a Union body demonstrates an exceptional need [. . .] to use certain data [. . .] to carry out its statutory duties in the public interest, data holders [. . .] which hold those data shall make them available upon a duly reasoned request."[74] It means that public authorities must justify their data requests by demonstrating an "exceptional need." Formally, this provision "shall not affect the obligations laid down in Union or national law for the purposes of reporting, complying with requests for access to information or demonstrating or verifying compliance with legal obligations."[75] However, in practice, this framework may encourage narrow interpretations of public authorities' rights to access environmental data held by corporations. Furthermore, it risks to undermine the right for public bodies to access information needed *for lawmaking purposes*,[76] which would reinforce information asymmetry between regulators and regulated entities at a critical stage of the legislative process.[77] The recent Energy Efficiency Directive further highlights this risk, as it expressly authorises Member States to require companies to provide specific types of information needed for rulemaking purposes.[78] One might interpret this to suggest that, in the absence

(accessed 15 August 2024) ("The trend against data openness has been exacerbated by two more general phenomena in the data sphere: the rapid ascent of generative AI, and a general stalling on the policy and regulatory front.")

[70] Finck and Mueller (n 61), 122–3.

[71] Art. 2.16 of the Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act), OJ L 152, 3.6.2022, p. 1.

[72] Finck and Mueller (n 61).

[73] Ibid., 129. See also Mario Draghi, The future of European competitiveness, Part B: In-depth analysis and recommendations, September 2024, 302, at <https://commission.europa.eu/document/download/ec1409c1-d4b4-4882-8bdd-3519f86bbb92_en?filename=The%20future%20of%20European%20competitiveness_%20In-depth%20analysis%20and%20recommendations_0.pdf> (accessed 2 September 2024) (asserting the need for financial incentives to bolster open-access).

[74] Art. 14 of Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828, OJ L, 2023/2854, 22.12.2023.

[75] Ibid., Art. 16.

[76] For an example of the right for environmental regulators to require companies to provide all necessary information to perform their lawmaking tasks, see, e.g., Art. 3 of the Directive 2009/125/EC (n 39).

[77] See, e.g., Friedrich A. Hayek "The Use of Knowledge in Society" (1945) 35 The American Economic Review, 519.

[78] Annex XI of the Directive (EU) 2023/1791 (n 27).

of such explicit legislative authorization, similar data requests could be considered unlawful.

This approach reflects a neoliberal paradigm in digital governance. As Cohen observes, neoliberal governmentality reshapes public institutions in the image of private economic actors, subordinating regulatory authority to market logic. The EU's data laws, by framing the government as a participant in data transactions, rather than as a sovereign actor engaged in legislative activity, tend to erode its ability to mandate disclosure in the public interest. If confirmed, this shift would not only depoliticize environmental communication and weaken the public's right to access environmental information; it would also undermine the effectiveness of environmental regulation – particularly by increasing reliance on corporate reports, which often overstate companies' ability to meet environmental commitments and downplay the extent of their actual adverse impacts on nature.[79]

While the legal status of data and the question of its appropriation remain contested, the narrative of "data for good" – particularly the use of environmental data to foster sustainability-related innovation – is increasingly invoked to justify granting extensive control rights to environmental data producers.[80] This trend risks undermining the principle of data openness, which lies at the heart of environmental law and is essential to both its effectiveness and its democratic foundation.

The commodification of environmental data is already on its way. Climate data – traditionally treated as a public good[81] – is increasingly subject to privatisation. The expanding market for climate risk models exemplifies this shift, raising concerns about equity and access. These models, and the data on which they rely, are often inaccessible to non-subscribers, prioritising the needs of financial actors conducting investment risk assessments over broader objectives such as disaster preparedness and climate action in the public interest.[82]

This trend is not confined to climate data; it extends to a wide range of environmental datasets. It is driven by business models that profit from data appropriation, and reinforced by legal structures that enable and legitimize such practices.

The perception of data as inherently useful also exposes another regulatory fault line: while the EU actively promotes the circulation of environmental data, it does not regulate its content in a way that supports a transition toward more thoughtful and ecologically attuned forms of engagement with nature.

2. Inadequate Regulation of the Content of Environmental Data

Information is not a passive input into decision-making processes; it is socially constructed – someone decides what data is (or is not) generated, where, and when[83] – and politically charged – reflecting particular worldviews, interests, and priorities.

[79] See, e.g., M Lepere, S Maso, Y Dong and D Aikman "Emissions dissonance: Examining how firm-level under-reporting undermines policy." Working Paper presented at the 2025 Conference of the Society for Environmental Law and Economics.

[80] M Espinoza and M Aronczyk "Big data for climate action or climate action for big data?" (2021) 8(1) Big Data & Society, 1–15.

[81] Data on greenhouse gas emissions, their causes, and consequences are classified as information on emissions under the Aarhus Convention. As such, this data cannot be withheld on the grounds that it constitutes a trade secret. This principle stems from the understanding that "information about emissions would lose its proprietary character once the emissions enter the public domain" (United Nations Economic Commission for Europe, The Aarhus Convention: An Implementation Guide, 2014, 2nd ed., 88, at <https://unece.org/environment-policy/publications/aarhus-convention-implementation-guide-second-edition>, accessed 10 June 2025).

[82] Mankin (n 15).

[83] Fisher, Kingsbury and Streinz (n 21).

Environmental data, in this sense, is far from neutral. It embodies normative choices that shape how environmental problems are defined and how corresponding solutions are framed. For instance, an over-reliance on environmental efficiency indicators can inadvertently legitimise practices widely considered unsustainable, such as the continued intensification of the livestock sector, under the guise of improved efficiency. This highlights the need for a critical reassessment of how environmental information is produced, framed, and mobilized in policy processes.

Yet the current EU legislative framework reveals significant shortcomings in regulating the substantive content of environmental data. This regulatory gap limits the ability of data to drive effective ecological change. Addressing this issue should be treated as a legislative priority if environmental information is to serve as an engine for social transformation.

There is no unified framework governing environmental data in the EU; rather, existing legislation remains fragmented, with environmental data serving a range of distinct purposes. Traditionally, environmental disclosure frameworks were intended to support compliance with regulatory obligations while also promoting environmental democracy. Increasingly, however, disclosure-based governance is being leveraged to integrate sustainability considerations into market transactions and to drive environmental transformation within organizations – particularly within corporate structures.

The Ecodesign Regulation[84] is a prime example of the market-based rationale for environmental disclosure requirements that is gaining ground across the EU. This Regulation aims to make products sold in the EU more durable, reusable, repairable, recyclable, and energy-efficient – and thus to reduce their overall environmental impact. A central feature of this initiative is the planned rollout of Digital Product Passports, designed to provide information about a product's environmental performance, among other characteristics. Information is at the heart of this system, based on the assumption that *"by providing appropriate means for purchasers and public authorities to compare products on the basis of their environmental sustainability, information requirements are expected to drive consumers and public authorities towards more sustainable choices."*[85] This market-driven approach, in turn, relies on the European Commission's standardisation of data points through delegated acts.

The process of determining which data must be included in the Digital Product Passport appears prone to exclusionary outcomes. While the Regulation requires the European Commission to consult experts from Member States and relevant stakeholders before adopting delegated acts, it grants public authorities – starting with the Commission – broad discretion in structuring these consultations and determining who is invited to participate.[86] This creates a risk of disproportionate representation by certain stakeholder groups,[87] which may in turn influence the relevance and balance of the required data points. A useful analogy can be drawn from the AI Act, where the narrow scope of environmental reporting obligations – for example, the exclusion of information on water consumption or energy use during the inference phase[88] – may well reflect the disproportionate influence of major technology firms during the legislative process.

Moreover, the obligation to create and update a Digital Product Passport for each product entails significant costs. Many small and medium-sized enterprises (SMEs) may

[84] Regulation (EU) 2024/1781 (n 39).

[85] Recital 28 of Regulation (EU) 2024/1781 (n 39).

[86] Art. 19 and 20 of Regulation (EU) 2024/1781 (n 39).

[87] See more broadly M Strömvik and J Verheij "Transparency and stakeholder participation in executive EU lawmaking" (2022) 4 Viewpoint Europe : Lund University/ Centre for European Studies, at <https://www.cfe.lu.se/sites/cfe.lu.se/files/2022-09/Delegated%20acts%20for%20web_0.pdf?utm_source=chatgpt.com> (accessed 5 June 2025).

[88] See, e.g., Le Goff (n 9).

struggle to absorb the financial burden of digitalising their operations to meet these requirements. In the absence of effective support mechanisms, the mandate to assign a digital passport to all products placed on the EU market risks accelerating market consolidation, favoring larger companies that are better resourced and technologically equipped to comply.[89] Importantly, the cost of implementing the Digital Product Passport is not purely financial – it is also ontological. By embedding a specific mode of engagement with the environment – one that treats nature as an external object to be observed, measured, and verified – the Digital Product Passport risks entrenching a technocratic and instrumental approach to nature. Viewed through this lens, the Ecodesign Regulation might appear less as a corrective to the industrial paradigm of domination over nature, and more as a continuation of it.

Last but not least, by limiting substantive environmental performance standards to what is considered *economically feasible* and compatible with competitiveness,[90] the Ecodesign Regulation effectively shifts the responsibility for achieving *socially desirable* levels of environmental impact reduction from producers to end-users – including not only individual consumers, but also large organisations. In a context where public procurers often operate under resource constraints, this information-driven, demand-side approach largely relies on whether firms – particularly larger ones – will actively use disclosed data to support a transition toward more sustainable consumption and production patterns. However, the increasing availability of data on the environmental footprint of economic activities does not, in itself, guarantee more sustainable corporate decision-making.[91]

The persistent gap between the growing volume of environmental data and the limited changes observed in business models and investment strategies is often seen as evidence that data in circulation lack sufficient reliability or comparability.[92] This interpretation has contributed to a shift in policy discussions – from a focus on environmental governance, aimed at limiting environmental harms and enhancing nature conservation and restoration, to an emphasis on data governance, concerned with improving data quality and standardisation. Yet this line of reasoning overlooks a more fundamental issue: acting on environmental data involves costs, and the current legislative framework in the EU neither mandates nor sufficiently incentivises firms to internalise these costs. In this context, disclosure-based regulation risks merely reinforcing the *status quo*.

Information disclosure obligations have become the EU's primary instrument for advancing a new era of corporate environmental stewardship. The underlying logic is captured in the managerial slogan: "You manage what you measure."

The well-documented tendency of companies to under-report their negative environmental impacts[93] has not fundamentally altered regulatory reliance on corporate self-reporting. Alternative channels of data collection, such as satellite-based monitoring of atmospheric pollutants, remain underutilised.

This insistence on corporate self-reporting persists largely because governments continue to view corporate data generation not only as a means of shifting the cost burden of data collection onto companies – a rationale that is itself open to question – but also as a

[89] Art. 22 of Regulation (EU) 2024/1781 (n 39), although focused on SMEs, does not seem to provide effective means to ease the burden of compliance for SMEs.

[90] See above, Part I-A.

[91] Doan and Sassen (n 18).

[92] See, e.g., Chris Newlands 'Data Shortfall Undermines Esg Investment, Asset Managers Warn' *Financial Times*, 9 Dec. 2024, at <https://www.ft.com/content/41125a1b-f12e-4f4f-b8e1-c11ca1fce952> (accessed 10 June 2025) accessed 10 June 2025) ; OECD, Behind ESG Ratings : Unpacking sustainability metrics, 2025, at <https://www.oecd.org/content/dam/oecd/en/publications/reports/2025/02/behind-esg-ratings_4591b8bb/3f055f0c-en.pdf?utm_source=chatgpt.com> (accessed 5 June 2025).

[93] Lepere, Maso, Dong and Aikman (n 79).

mechanism for encouraging firms to engage in a process of continuous environmental improvement. This belief reflects a shifting conception of the corporation – one that frames it not as a market actor or political agent, but as a form of artificial intelligence.[94] In line with this cybernetic vision, corporations are increasingly depicted as self-regulating systems capable of evolving through iterative learning, using data to refine their programs and optimise their operations. As a result, legislation is increasingly oriented toward promoting the production of environmental data, based on the assumption that such data will inherently drive more adaptive and ambitious forms of private environmental governance.

This regulatory trend reflects a deeper tension between competing logics in EU environmental governance. On the one hand, market-oriented approaches emphasise the need for standardised and comparable data across sectors and actors, aiming to create comparability and level the playing field. On the other hand, cybernetic-inspired regulation embraces a vision of the firm as a self-referential, adaptive system – one that defines its own environment and determines the nature of its relationship with it. The influence of this latter narrative helps explain the persistent discretionary power granted to corporations in selecting the environmental data they generate and disclose, despite increasing efforts to standardise sustainability reporting.

This dynamic is clearly reflected in recent legislative developments. The Corporate Sustainability Reporting Directive (CSRD),[95] for instance, while introducing important limitations on corporate discretion, establishes reporting standards that remain broad and open to selective interpretation – particularly due to the open-ended nature of the "impact materiality" threshold for disclosure. Furthermore, the information and communication technology (ICT) sector is still not subject to sector-specific reporting standards,[96] further reinforcing the discretionary space available to companies operating in this field.

This regulatory flexibility also derives from the absence of binding rules governing voluntary environmental disclosures. Although misleading claims can, in theory, be sanctioned,[97] enforcement remains weak in practice – primarily due to the lack of fully harmonised reporting standards.[98] Moreover, the limited public access to corporate environmental data severely restricts the ability of third parties to identify and substantiate instances of fraud or misrepresentation.[99]

Absent a reform of how large firms – within the ICT sector and beyond – are governed, and of whose interests corporate managers are ultimately expected to serve, there is little doubt that this regulatory discretion will continue to be used to dilute society's ecological ambitions. In other words, by failing to reconfigure the deeper organisational parameters

[94] AS Epstein "Trois modèles pour mieux comprendre et orienter le droit de la gouvernance d'entreprise durable" (2025) Revue des Sociétés (forthcoming).

[95] Directive (EU) 2022/2464 (n 54).

[96] EFRAG, Sector-specific ESRS, at <https://www.efrag.org/en/sustainability-reporting/esrs-workstreams/sectorspecific-esrs> (accessed 5 September 2024).

[97] See notably the Directive (EU) 2024/825 of the European Parliament and of the Council of 28 February 2024 amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and through better information, OJ L, 2024/825, 6.3.2024.

[98] Epstein (n 17), 369 ff. On misleading claims related to the fungibility of greenhouse gas emissions – such as carbon offsets and removals – and the role of corporations in shaping emerging standards for invoking such claims, see notably M Condon (2023), "'Green' Corporate Governance" in JN Gordon and W-G Ringe (eds.), *Oxford Handbook of Corporate Law And Governance* (2nd ed, Oxford University Press, forthcoming); K Bryan, C Hodgson and J Tauschinski, "Big Tech's Bid to Rewrite the Rules on Net Zero" *Financial Times* 14 August 2024, at <https://www.ft.com/content/2d6fc319-2165-42fb-8de1-0edf1d765be3> (accessed 20 September 2024).

[99] SHERPA, The EU Commission's Draft Directive on Corporate Sustainability Due Diligence: Analysis and Recommendations, 2022, 7, at <https://www.asso-sherpa.org/wp-content/uploads/2022/10/Sherpa-September-2022-The-EU-Commissions-draft-directive-on-corporate-sustainability-due-diligence.pdf> (accessed 5 June 2025).

of corporate governance, EU law risks reducing environmental reporting to a bureaucratic exercise, rather than enabling it to serve as a meaningful discovery process – capable of prompting operational reinvention and a genuine shift in business models.

Against this backdrop, the assumption that increasing data availability will automatically advance sustainability objectives is misguided. Much of the environmental data currently produced serves commercial rather than ecological purposes, reinforcing rather than challenging unsustainable economic models. For example, carbon accounting platforms often allow companies to rely on unregulated offsets instead of reducing actual emissions.[100] Likewise, many climate risk models tend to underestimate potential damages, thereby supporting business-as-usual investment strategies rather than catalyzing ambitious climate action.[101]

Crucially, the fact that for-profit entities control the production of environmental data risks embedding their short-term profit orientation into the very fabric of environmental governance. This dynamic can result in datasets shaped by the strategic goals and inherent biases of these firms. AI systems trained on such skewed data risk reinforcing inadequate sustainability frameworks, further entrenching the *status quo* rather than enabling systemic change.

Conclusion

This article has shown that EU environmental law not only fails to limit the environmental damages caused by digital infrastructures, but even supports the spread of digital infrastructures throughout society. In doing so, environmental law may inadvertently sideline low-tech solutions and traditional ecological knowledge, further entrenching what scholars describe as the "values of infinity, abundance, and growth that drive industry and policy solutions."[102] As a result, it risks falling short of disrupting the "dominant destructive environmental identifications" or enabling a meaningful transition toward "more regenerative futures" and "ecocultural identities."[103]

This article also highlighted how EU law is increasingly shifting control over environmental data to corporate actors – a development that risks undermining not only environmental enforcement but also environmental justice and democracy. At the same time, EU legislation largely allows companies to decide which environmental data to disclose. This approach risks shaping environmental policy around incomplete or strategically curated information, and is unlikely to deliver meaningful ecological outcomes without deeper reforms that realign the incentives guiding corporate behaviour with environmental sustainability.

[100] F Pratty "Race to Cut Carbon Emissions Fuels Climate Tech Boom" *Financial Times* 5 May 2022, at <https://www.ft.com/content/a814bf48-e281-4e0c-bebc-6f80bd6a7b45> (accessed 29 September 2024).

[101] S Trust, S Joshi, T Lenton and J Oliver, The Emperor's New Climate Scenarios: Limitations and Assumptions of Commonly Used Climate-Change Scenarios in Financial Services, July 2023, at <https://actuaries.org.uk/media/qeydewmk/the-emperor-s-new-climate-scenarios.pdf> (accessed 29 September 2024); G Le Quang and L Scialom "Better Safe Than Sorry: Macroprudential Policy, Covid 19 and Climate Change" (2022) 172 International Economics, 403; M Condon "Market Myopia's Climate Bubble" (2021) Utah Law Review, 63.

[102] Jansen et al (n 13).

[103] T Milstein, G Mocatta and J Castro-Sotomayor, "Media and Ecocultural Identity" in A López, A Ivakhiv, S Rust, M Tola, AY Chang and K-w Chu (eds), *The Routledge Handbook of Ecomedia Studies* (Routledge 2024) 231 ("All identities are sociocultural as well as ecological. These ecocultural identifications – whether conscious or not or whether destructively anthropocentric or restoratively ecocentric – shape individual, group, and institutional environmental meanings, relations, and practices. The task of understanding ecocultural identities is deeply important to the urgent project of transforming dominant destructive environmental identifications to have capacity to transition to more regenerative futures").

If accurate, these findings reveal that applying existing environmental laws to digital infrastructures is deeply insufficient. Environmental law itself must be reimagined to effectively confront the ecological consequences of digitalisation. As this article argues, we must ask whether such a transformation is even possible if it depends on digital technologies and the reduction of nature to mere data.

That said, if digital infrastructures are to play a meaningful role in advancing environmental reform, the regulatory frameworks governing their development must move beyond a reliance on self-regulation and data disclosure. Instead, legislation should focus on achieving concrete ecological outcomes and enabling systemic change.

At the same time, data governance should be restructured: rather than promoting the unchecked expansion of environmental data on the assumption that more data will automatically lead to better ecological results, public authorities should support democratic deliberation about which data are genuinely necessary. This calls for a principled approach to data restraint – one grounded in ecological purpose and democratic deliberation.

This means that the EU must reorient its focus from *data* governance to *environmental* governance, creating conditions that empower and incentivise economic actors to act meaningfully on the environmental information they produce or receive.

In short, a credible twin transition must be accompanied by a corresponding "twin turn": one that recognises nature as more than data, and democracy as more than a one-way process of information dissemination. Without this dual shift – ecological and democratic – the promise of digitalisation as a driver of environmental transformation is likely to remain unfulfilled.

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