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GOVERNING DIGITAL INFRASTRUCTURES FOR A SECURE AND SUSTAINABLE FUTURE

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We submit this feedback in response to the White Paper, "How to Master Europe's Digital Infrastructure Needs?". We are ten researchers affiliated with universities in the Netherlands, Germany, Ireland, Italy, and Sweden, conducting research on digital infrastructures and communication. We urge European institutions to base the central claims of the White Paper regarding citizen and societal benefits of digital infrastructures on stringent and independent research that recognises the potential and ongoing harms and conflicts prompted by current digitalisation strategies. We also call for the expansion and further specification of section 2.3.5 on Sustainability Challenges and suggest several additions to that end.

Although digital infrastructures are heralded as the backbones of digital societies, our research demonstrates that their proliferation leads to new social and environmental justice implications and inequalities. These must be rigorously accounted for in European policy-making surrounding the infrastructural needs and demands of digital industries and economies. Social science and humanities research provides a useful basis for such evidence-based policy-making regarding Europe's digital infrastructures and acts as an important democratic counterweight to existing technically-driven accounts. European institutions should therefore work towards legislative frameworks that allow researchers to identify and anticipate the impacts resulting from building and governing digital infrastructures, especially if the aims of the "twin transitions" of digitalisation and decarbonisation are to be achieved equitably and sustainably.

This response is informed by our collective findings from two collaborative research workshops on "Greening the Digital Society" held at Utrecht University in Spring 2024, which synthesized results from multiple research projects on digital infrastructure policy, energy use, data centres, AI technologies, and social and environmental sustainability of digital technologies.[2]

We structure our response to this consultation process along four key demands.

European policy-making related to secure and sustainable digital infrastructures should:

1. View and regulate data centres as ***utilities***.
2. Increase the level of ***transparency*** in energy use and resource use reporting, broaden the scope of metrics in all EU Member States, and make reports available for research.
3. Address the issue of ***competition over base resources*** — water, electricity, land — to ensure that all industrial sectors have equal access to essential societal infrastructures.
4. Include ***public-interest decision-making*** on digital infrastructures.

1. Provision of utility services

The data centre industry has evolved from merely providing storage to playing a critical role in delivering utility services such as heat, grid management, and storage of government data. In the energy sector, data centre operators are also evolving into energy brokers by buying and potentially reselling

[2] The research that forms the base of this collective response has been conducted within the following projects: 1) Megabytes vs Megawatts: Understanding Infrastructural Frictions between Data Centres and Energy Grids for Sustainable Digitalization (PI Julia Velkova, funded by Marianne and Marcus Wallenberg Foundation), 2) REIMAGINE ADM: Reimagining public values in algorithmic futures (PI Minna Ruckenstein and Co-PI Julia Velkova, funded by the EU, Collaboration of the Humanities and Social Sciences in Europe Programme, call Mitigating Harms of Digitalization). 3) SustAIn: The sustainability index for Artificial Intelligence (PI Anne Mollen), funded by the German Ministry for the Environment as an AI Lighthouse project. 4) Greening the Digital Society, a special interest group of the Governing the Digital Society research focus area at Utrecht University (co-PIs Judith Keilbach and Anne Helmond), 5) The Critical Infrastructure Lab (co-PIs Fieke Jansen, Maxigas, and Niels ten Oever, funded by the Ford Foundation, Internet Society Foundation, Dutch Research Council, and Open Technology Fund).

both access to electrical power, as well as data about it, becoming key factors in the function and planning of decarbonised energy systems. Despite these dependencies between data centres and essential infrastructures, *data centres are neither regulated as utilities, nor as infrastructure, nor as energy providers, and thus have no obligations to maintain public service quality and serve the public interest*. The potential suspension of these services (for example, due to cost-saving measures) can have severe repercussions for national security, climate action, state and public services operation, as well as urban energy provision in those cases where digital infrastructure operators distribute energy or waste heat.

Given their expanded role and the critical services they provide, data centre operators should be subject to the same scrutiny as utility providers. They are integral to the infrastructure that the public relies on, and their operations must be transparent and regulated with adequate oversight to ensure the continuous provision of these essential services. Additional scrutiny must also be exercised in the case of proprietary infrastructure built by tech companies — such as fibre optic cables, electrical substations and transformers — that might be siloed from public use but could deliver great benefits to rural and remote areas that lack connectivity or service provision. In these instances, we recommend enhancing overall infrastructure resilience by opening infrastructure — rather than just services on top of it — for public benefit.

2. Transparent data and accurate resource use reporting

We welcome the recognition that ICT is a growing consumer of electricity in point 2.3.5. of the White Paper, with a special focus on the energy needs of data centres. However, EU-wide data of sufficient granularity regarding grid capacity bookings and actual electricity usage is missing. This lack of publicly accessible information severely constrains the ability to assess digital technologies concerning sustainability objectives and hampers the planning of adequate data centre siting. This has already led to situations in EU Member States like Ireland, where digital infrastructure operators have destabilised regional grid capacity provision, risking increases in the price of electricity for end-users and obstructing citizens and other sectors from accessing the electrical grid. In addressing these issues, we call for the full "European database on data-centres" established by the Commission Delegated Regulation (EU) 2024/1364) to be:

a) Integrated in the work on EU digital infrastructure policy development.
b) Made public in its entirety for research and planning, facilitating informed decision-making on data centre siting and construction, as well as the accurate assessment of environmental and societal impact.
c) Expanded in scope to include data on reserved grid capacities, their duration, and actual usage. Additionally, all data about Power-Purchase Agreements for renewable energy contracted by the digital sector—including their duration—must be made public in order to monitor the risk of renewable energy monopolisation by the ICT sector.
d) Expanded towards a life-cycle focus, acknowledging all environmental impacts from raw material extraction to the end of life/disposal of digital infrastructures.
e) Aggregated not at the state-level, but rather with sufficient precision to include information on individual data centres in specific regions and cities. Currently, these data are confidential to protect commercial interests, but they are crucial for academic and civil society research to assess the local impacts of digital infrastructure comprehensively and enable its secure and sustainable siting.

Encompassing transparency in these areas will lead to a better understanding of the economic and environmental impacts of infrastructure projects and secure better democratic collaboration with communities affected by them. Claims regarding potential energy and emissions savings cannot be substantiated without making the aforementioned data available. An example of poor transparency is digital infrastructure operators' dependency on fossil fuel supplies, such as for periodic backup. This practice must be opened to independent investigation to collect verified data and quickly phased out. Transparency should serve as a basis for the contestability of digital infrastructures.

3. Sustainable competition in the single market

We call on European institutions to address the issue of competition related to data centres and their impact on societal infrastructures. *In several locations across Europe, data centres are currently limiting access to essential public infrastructures — such as water, energy, and communication systems — for future use by overbooking their capacity and thus making them unavailable to other competing industries and actors*. This occurs due to their practice of over-reserving water and energy capacities for long durations without actively using them, or by placing significant weight on fibre optic networks for certain data traffic. It is imperative to develop rigorous and equitable principles regarding how much public infrastructure capacity can be allocated to different actors in society. Without such priorities, other economic activity and industries risk being dislocated or unfairly disadvantaged. Establishing these principles will strengthen the competitiveness of all sectors within local and national economies. The dependency on a select few data centre providers increases risks and dependencies for small and medium-sized enterprises (SMEs). To mitigate these risks, it is critical *to ensure a competitive environment where all sectors, including SMEs, have fair access to essential societal infrastructures and public resources such as water, land, and energy*.

Recent digital policy regulation in the EU has demonstrated the necessity and ability to effectively regulate key tech companies, as seen in the data protection area, to prevent detrimental effects on consumers and Member States resulting from heavily concentrated digital industries. From this perspective, and to avoid similar risks of resource concentration, data centre infrastructure should be subjected to the same scrutiny and regulation as other industries in allocating resources from infrastructures of water and energy provision (see Point 1).

4. Public-interest decision-making on digital infrastructures

The construction and maintenance of digital infrastructures and all related decision-making must take into account the interests of local populations, both across Member States as well as on a global scale. Impact assessments must take a broad view of the contexts in which any plans for the expansion of digital infrastructure are carried out. Digital infrastructure policy and subsidies for the industry from Member States must balance the justified need for innovation and European technological independence and security with the historical relationships between communities, landscapes, and ecosystems. Public acceptance of digital infrastructure projects will not materialise if such projects ignore the voices of local communities and do not credibly consider impacts to local livelihoods and ecosystems, such as in the case of encroachment on Sámi land and reindeer husbandry in the Nordic States. Other examples include the Netherlands — a Member State with deteriorating groundwater quality that is alternately fighting droughts and floods — where drinking water is used to cool some data centres, while better alternatives are available. Beyond the immediate geographical area, impact assessments and public-interest decision-making should account for supply chain dependencies of a growing data centre industry, for example in the case of critical natural resources and conflict minerals extracted from landscapes and inhabited by peoples seemingly remote from the actual sites of planned data centres.

European legislators must therefore establish adequate frameworks to allow local stakeholders to make informed choices and participate in decisions about the construction and maintenance of digital infrastructures and their geographically distributed cumulative impacts, especially in areas with a high concentration of such infrastructures. Public interest-oriented decision-making will counter the preferential access that dominant tech industry actors, through lobbying activities, often have with regional decision-makers. Such decision-making should be coordinated on appropriate geographical scales, otherwise it contributes to systematically exporting harms to regions where environmental regulations are the weakest and civil society the most vulnerable. We thus call upon European institutions to make progress towards decision-making processes that make digital infrastructures serve the public interest, based on transparency requirements, public interest research, and thorough and meaningful impact assessments as well as local consultation processes.

5. Environmentally-friendly video and standards

Finally, some of the aims of the White Paper are based on erroneous assumptions. For example, while the support for more efficient video technology noted in Section 2.3.5 is laudable, contrary to claims in the White Paper, newer generations of video codecs are not inherently more sustainable. In reality, such new technology is more computationally complex, and while it reduces data traffic and thus benefits operators of data infrastructure, it requires much *more* energy from consumer devices and necessitates new hardware, contributing to an environmentally damaging cycle of raw material extraction and e-waste. To achieve the White Paper's overlapping goals of economic security, sustainability, and innovation, environmental obligations such as low energy use and reduced resource consumption must therefore be explicitly mandated for digital infrastructure providers.

To achieve this, environmental obligations must be actively pursued at all levels of governance as part of technological standards-making, new infrastructure planning and development, and actual operation and management. For that pursuit to be effective, policy must be based on reliable, publicly accessible industry data, and data must be available for analysis and research. Digital infrastructure policy for the twin transitions can only fulfil its mandates when it can regulate the total resource input of the sector, rather than enabling isolated gains from optimised resource efficiency in components, techniques, and sites that result in increased competitiveness but allow continued expansion.

Concluding remarks

Uncontrolled and unregulated development of data infrastructure results in societal, economic, and environmental harm. The provision of support and future policies for developing computation-intensive digital infrastructures in the European Union must be therefore carefully designed to prevent such detrimental effects.

If the issues described above are not addressed and further researched, the ongoing unequal and largely intransparent allocation of resources that privileges the data centre sector will become a basis for new conflicts and public discontent among citizens, local industries, regions, and Member States over access to shared public resources and infrastructure. This is already evident in EU Member States at the forefront of hosting such infrastructure, such as Ireland, Sweden, and the Netherlands. Water shortages, excessive land use, and inefficient re-use of waste heat will add to such conflicts and jeopardise the legitimacy of digitalisation amidst the wider societal imperatives towards decarbonisation and sustainability.

Truly sustainable digital infrastructure requires a comprehensive, evidence-based understanding and governance of resource allocation and its public reporting that includes equitable access to and stewardship over shared environmental and communal resources, and the equal opportunity for competition between all sectors based on the principles of transparency, public access, and respect for public values. We trust that European institutions will acknowledge the measures suggested above as critical towards achieving these goals.