Conference

Sustainable Digitalization in Europe:
Focus on data infrastructures and cloud computing

21-22 March 2024 | Amsterdam | Het Trippenhuis

Digitalisation in Europe is in full swing and increasingly of strategic importance for the European project. According to the European Commission "the twin challenge of a green and digital transformation has to go hand-in-hand." Cloud computing's energy consumption is steadily growing, making the case for its very own sustainability ever more pressing. This conference engaged in the interdisciplinary space where digitalisation and sustainability intersect in Europe.

The objective of this conference was to explore from a multi-disciplinary perspective the theory and practice of meeting the twin-challenge of a green and digital transformation. Putting sustainable data infrastructures at its centre, this conference sought to address four themes:

1. The European Green Deal in digital transformation
2. Data Centers at the Crossroads: A dialogue on digitalisation and sustainability
3. Policy dialogue: Civic participation and contestation of data infrastructures
4. Digital sustainability through the lens of energy-value trade-offs

The small conference brought together academics, policymakers, business leaders and civil society to upgrade our canon of conception, approaches, and narratives on sustainable digitalisation.
Organisers: Kristina Irion | Ana Oprescu | Ans Kolk | Stefania Milan

The conference was organised by the Amsterdam Centre for European Studies (ACES) which is part of the University of Amsterdam. The conference was co-promoted by the Institute for Information Law (IViR), Informatics Institute (IvI) and the Amsterdam Business School (ABS) at the University of Amsterdam.

Summary of the discussion

Panel 1: The European Green Deal in digital transformation

Chair: Kristina Irion (University of Amsterdam)

Speakers: Manuel Mateo Goyet (European Commission), Nadja Salzborn, (German Federal Environmental Agency), Alex de Vries (Vrije University Amsterdam), Corinne Cath (Technische Universiteit Delft)

The panel started with a presentation of the Commission's objective of climate neutral, highly energy efficient and sustainable data centres by 2030, highlighting its position that with the right policies the contribution of digitalization will be greater than its impact. The legislation discussed included the Energy Efficiency Directive, the EU Taxonomy Regulation and Waste from Electrical and Electronic Equipment (WEEE) Directive. This was followed by a discussion on research that growing carbon footprint of AI and the 'bigger is better' dynamic, raising the question whether the growth in emissions of data centres can truly be combined with sustainability issues. AI requires specific equipment which depreciates quickly and consumes significant amounts of water for cooling.

The discussion then moved to the national level response and the work of the German Federal Environmental Agency. This included discussion of a national study, which informed the new national Key Performance Indicators (KPIs) and forms the basis of the Blue Angel standards for data centres in Germany. An overview of the German Energy Efficiency Act was also given, which raised the question of how we can we strengthen criteria and KPIs. The Coalition for Digital Environmental Sustainability (CODES) is an example for international cooperation on this issue.

The discussion concluded by taking a broader perspective and asking what a critical data centre policy would look like by questioning 'why the cloud,' where the power truly lies in this issue and whether this should be the case. The Jevons paradox was invoked, which is used to coin that efficiency gains do not reduce but instead drive increased demand. A critical stance on recent EU policy's equating of 'sustainability' with 'climate neutrality' (aka carbon reduction) was provided, proposing the emphasis on carbon should be replaced by considerations of resource scarcity, to include carbon and energy but also rare metals, water, and land.

As the discussion moved from the panelists to the participants, the conversation centered on exploring these different narratives, engaging with questions of balancing AI sustainability implications with its value and the centralization of energy production within digitalization. Equally, the issue was raised that the reporting requirements for data centres in the Energy Efficiency Directive has been raised from 100kW to 500kW.

Panel 2: Data Centers at the Crossroads: A Dialogue on Digitalization and Sustainability

Chair: Václav Ocelík (University of Amsterdam)

Speakers: Erik Barentsen (Senior Consultant Energy Efficiency), Irene Niet (Technische Universiteit Eindhoven), Max Schule (Sustainable Digital Infrastructure Alliance).

The second panel started with an overview of what matters in the discussion about data centers such as the difference between collocation data centers and hyperscalers, latency, and criticality. There is currently not a lack of law as Dutch environmental law already prescribes an environmental impact assessment and the requirements stemming from the Energy Efficiency Directive. The discussion centers on the weighting attached to people, planet, and profit which tips towards the latter. The panel notes the differentiation between scope 1, 2 and 3 greenhouse gas effects and that sustainability standards for data centers could improve scope 2 and 3 to some extent.

The idea underlying green coding initiatives can also be transposed to the (otherwise) highly extractive AI training, for instance software and AI can be "recycled" in order not to retrain. There is an issue with public participation and democratic accountability. People lack information about the environmental costs of using a particular service or apps involving cloud computing. Issues surrounding rare metals were mentioned and how the extraction is pushed to the fringes of Europe, impacting cultural and social conditions.

This was followed by a call for improving system-level thinking and to apply the focus to the applications and services relying on computing infrastructures instead on the data centres. Likewise, forecasting demand and getting values into digital products should be done on the system-level. This would foster a differentiated discussion on markets, products, and technology. The panel also highlights ownership issues of colocation facilities which are concentrated in the hands of a few global investors. Here the rebound effect also comes to fore whereby increasing efficiency could just increase supply.

One suggestion made is to expand the notion of sustainability to include economic and social aspects as well.

Panel 3: Policy dialogue: Civic participation and contestation of data infrastructures
Chair: Stefania Milan (Department of Media Studies, University of Amsterdam)

Speakers: Fieke Jansen (Critical Infrastructure Lab, University of Amsterdam), Julia Rone (Minderoo Centre for Technology and Democracy, University of Cambridge), Marleen Stikker (Founder and Director of Waag, Amsterdam), Alex Gekker (Media Studies, University of Amsterdam).

This panel started off with recognizing that if we talk about data and digital, we must talk about infrastructure. The concept of a cloud factory was introduced, the B2B relationships and that the study of the political economy of computing should be done through the lens of the digital service. Contesting data centers policy more broadly instead of tackling individual data centers. There is a lack of democratic and citizens participation for instance in the way EU subsidies for data infrastructures

are granted. Overall, there is a tension between urban and peripheral regions exposure to and benefit from data infrastructures.

From there the question was raised if we are still in charge of the digital narratives and why all is geared towards data-driven processes and growth. The entire framing of sustainable digitalization makes no sense because there is no such thing as green IT. Instead, the better framing of a requirement for digitalization would be "non-extractiveness" with environmental, people and societal dimensions to it. Another issue that was raised is the scarcity of renewable energy which begs the question how we want to spend it. There are also alternative futures where cloud infrastructures are federated, locally owned and sovereign.

Panel 4: Digital sustainability through the lens of energy-value trade-offs

Chair: Ana Oprescu (Informatics Institute, University of Amsterdam)

Speakers: Erik Otovic (University of Rijeka), Vijanti Ramautar (Information & Computing Sciences, Utrecht University), Chrysa Papagianni (Informatics Institute, University van Amsterdam), Leon Gommans (University van Amsterdam & KLM), Maja Hanne Kirkeby (University of Roskilde)

The panel launched with a discussion of research on energy usage, noting that 60% of energy used in devices is in the use phase, by consumers. This raised the key debate of the panel, the question of quality of security of our data or energy consumption. Rather than centre on this 'or' question, the importance of discussing how we use our IT and for what purpose was emphasized.

The panel elaborated on this issue by answering the question of what defines value when a research project requires the use of machine learning application. Participants were walked through the process of machine learning and, tying back to Panel 1, the 'bigger the model, the better' narrative was highlighted, which holds that the use of more complex models increase researchers' chances of being published. This was challenged by arguing the focus should be shifted from unnecessary complex models to creating more efficient processing steps. Part of this process is being achieved through optimization; however, this is motivated by increased execution speed, rather than sustainability issues, which most users are not aware of. This demonstrates the need to make the sustainability implications of ICT to the user.

The panel emphasized the important value that digital technologies bring to our lives and work, and noting rather than shaming or condemning tech companies, we should instead work to influence what values are embodied in our technologies. The way forward is not just to require but incentivize companies to report on all sustainability issues (not only the positive ones). The potential of strict external audits with an interdisciplinary approach was highlighted, as well as the importance of civil society activism in challenging companies to improve. The panel concluded with discussion of two use cases in the aviation industry on sharing of data through federated learning, which allows for sharing of knowledge through sharing of workflow algorithms, which requires less energy to transport than data sets. Equally, this method ensures security of data, linking back to the beginning of the panel's call to avoid creating an 'or' question of data security and energy efficiency.