The Climate Crisis is a Digital Rights Crisis: Exploring the Civil-Society Framing of Two Intersecting Disasters

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ABSTRACT

Digitization is often presented as one of the key technologies to avoid or mitigate the climate crisis. Yet, we see the same technologies being used to promote disinformation, facilitate unsustainable business models, and to surveil climate justice advocates and land defenders. We also see a growing digital divide, a disparity between communities that reap the benefits of modern internet infrastructures, and those communities whose land and labor are essential for the production of these infrastructures but who remain comparatively disconnected and are exposed to the negative material and social impacts of the technology.

In this paper we report and discuss our findings from exploring the intersection of the climate crisis and digital rights in an interactive workshop with civil society representatives and policy makers at an important digital-rights event in Brussels in the European Union. We asked participants to collectively explore prevalent issues, framing(s), and governance initiatives at that nexus. We found that, while our workshop participants were predominantly concerned with material aspects of digital infrastructures, awareness of governance and business models as relevant factors for equitable and just digital infrastructures is present. These aspects need to make their way into upcoming legislation.

KEYWORDS

digital rights, climate emergency, climate justice, European regulation, European industrial policy, sustainable ICT

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1 INTRODUCTION

Policy discussions and industry actions around the climate crisis and the green transition are happening in isolation from those who work to minimize the negative impacts of digitization and guarantee fundamental human rights in a datafied society. However, these three spheres are deeply entangled: while technology is often promoted as the solution to the climate crisis, a growing base of evidence shows that the extractivist nature, both for the materiality of internet infrastructures as well as internet business model, have an increasing impact on the well-being of people and on climate and environment. In addition, learning from Europe's migration crisis, the insecurity and conflicts triggered by climate and ecological crisis in the near future are expected to be met with exclusion, repression, and management of population through surveillance and control practices. To ensure that our future internet infrastructures center people and planet over profit and capital, policy makers, civil society, and industry need to understand this intersection and work towards sustainable solutions.

With the intention to foster a conversation on how climate justice relates to digital rights and the digitization agenda of Europe, we organized a workshop with the title "The climate crisis is a key digital rights issue"[1] at #PrivacyCamp23[2] in January 2023 in Brussels, Belgium. As an event that caters for the digital rights community and being hosted in the capitol of the European Union (EU),

[1] http://web.archive.org/web/20230127211553/https://privacycamp.eu/workshop-the-climate-crisis-is-a-key-digital-rights-issue/
[2] PrivacyCamp conference series: https://privacycamp.eu/

PrivacyCamp is frequented by a mix of civil society, activists, academics and policy makers, and features topics that range from privacy and data protection, surveillance, predictive policing and migration management, to disinformation and false solutionism in the context of the climate and ecological emergency. In our workshop, panelists offered different perspectives at the intersection of climate and digital rights, highlighting alternatives to political and industry responses that favor business-as-usual through off-setting and tech-utopian dreams, and towards changing the extractivist business model behind the internet so as to actually address the climate crisis from an Information and communication technologies (ICT) and digital rights perspective. Following the introduction by the panelists, we aimed to inspire engagement and discussion between participants and speakers through a workshop format. In a World-Café setup, participants had the chance to discuss two topics more in detail, get to know each other's position, and explore new positions, framings, and policy proposals. We encouraged participants to move the discussion away from policy and technology that "makes things a little less bad" towards making things actually better, in a just and equitable way.

This Paper and Contributions. In this paper we summarize the results of the workshop and the surrounding discussions. Specifically, we highlight issues, actors, and interactions that are, from the perspective of a European digital rights community, perceived to be at the center of where the climate crisis and the digital rights crisis meet. To the best of our knowledge, we are the first to explore this in a workshop-style environment. We link our findings to framings of that intersection in international discussions and literature.

Most interestingly we discover that the primary issue areas identified by the participants relate to the materiality of the internet – energy and emissions, extraction, manufacturing, and the right to repair, and less so to the underlying business models. This is surprising as information capitalism and the centralization of power, wealth, and knowledge in the hand of Big Tech is a key digital rights debate. Yet the groups that discussed framing(s) around digital rights and a "green" internet took a broader perspective and highlighted that the community needed to push the boundaries of what green technology means, whom it serves, where the responsibility for change lies, and how "false" climate solutions can be identified and engaged with. In defining key governance spaces, the question regarding how to responsible scale-up, from local conflicts and struggles to national and international policy debates, and engage in the different European policy debates while being mindful of who defines the problems and solutions, was raised. We also noted a desire to create common demands and policy outlines that reach across local, national, regional, and international governance spaces without diluting or exploiting harms to those communities immediately impacted by the climate crisis.

A European Digital Economy Within Limits? Overall we observed a nascent discussion that found an entry point into a new topic area "the broad nexus of the climate crisis and digital rights" through the environmental impact of the materiality of the internet. The debate naturally focused on perspectives and economic/political needs of Europe and the Global North but that did consider important aspects of international equity and justice for future internet. Yet, with a focus on remediating the immediate harmful impacts of technology through regulation and narrative shifts, no vision towards a framework for governing technology within planetary boundaries was expressed. In this paper we use the workshop conversations to map out the European policy space and to highlight areas where a public debate at the intersection of the climate crisis and the digital rights crisis could constructively center limits to economic growth and technological solutionism. This public debate needs to reach beyond tech regulation and must identify European industrial policy with its focus on competitiveness and growth as a primary driver of both crises. Our paper may serve as guidance for *LIMITS research community* to engage with policy debates and develop policy proposals that promote a just transition towards technological development within limits.

2 THE CLIMATE EMERGENCY AND DIGITAL RIGHTS

Digital infrastructures and new technologies have a material layer – the data centers, cables, routers and devices – and an immaterial layer – computational processes, policies, and ideologies. All aspects of (im)materiality have an impact on the environment and the climate. Academic debates on the environmental impact of the internet and new technologies are gathering pace and concern themselves with its material impact; from energy and water consumption of data centers to mining of critical raw materials needed for infrastructure and end-user devices [36, 65]. These bodies of work provide important insights into the physicality of the internet, less is known about the relationship between the immaterial layer and the environment. As such, the economic logic, the "internet's original sin" [74] aka information capitalism [9], and the power asymmetries that determine who gets to decide how problems and solutions are defined are missing from these critical analyses. To contribute to this body of knowledge this paper will explore how civil society organizations, and more specifically how digital rights organizations, frame and engage on this nexus in policy spaces. To do so, this paper will first explore contemporary academic debates on the materiality of the internet and the role of civil society, specifically digital rights advocacy, in society, before we situate these developments in relation to the European legislative context. Here we are particularly interested in the European legislative initiatives that are part of the "twin transition," the green and digital transition as envisioned by the European Commission.

2.1 The Materiality of the Internet

The material impact of digital infrastructures and new technologies are studied from different disciplines. While concepts of "computing within limits" [17, 56] envision ICT within global ecological and material limits with notions of engineering from the current abundance of resources with perspectives on much scarcer futures, the broader engineering community have engaged in quantifying the energy consumption and carbon emissions of Artificial Intelligence (AI) models [2, 34] and streaming services [50], and the estimating water usage of data centers [65]. Another strand of research aims to quantify the environmental impact of the extraction of raw materials and production of digital devices, from calculating the environmental impact of end-user devices [51] or a single critical raw material, such as silicon, needed to maintain and expand

the internet infrastructure [72]. All these pieces contribute to an understanding of the vast impact of the digital supply chain.

Along side, environmental social science scholars have theorized about the relation between water, land and energy uses in data centers and activism and public perception of surveillance infrastructure [36, 63]. Offered insight into conflict, resistance, and decision-making processes surrounding digital infrastructures [63], hidden labor of the digital supply chains [16]. Situate the politics of waste management in capitalist and colonial critique [47, 49], and foreground the capitalists logics, promoted by state and industry, that are prioritizing misleading climate solutions over actual solutions [5]. Legal environmental scholars have offer comparisons and critique in their analysis of upcoming legislative environmental protection proposals.

When it comes to developing sociotechnical imaginaries on sustainable technologies, dominant debates solely focus on how computing can support carbon reduction in other sectors or assessing claims on the role technology play in the reduction of carbon emissions domains such as transportation, building, manufacturing, agriculture, and energy [58, 62]. While these strands of research present a unique insight in the relationship between single technology and the environment, they omit to engage with the underlying values of infinity, abundance and growth that drive industry and policy solutions, which have been critically examined by media studies scholars such as Brodie [4], Velkova [70], and Gabrys [32].

2.2 Digital Rights and Climate Activism

To gain insight into the immaterial layer of digital infrastructures, i.e. how power operates and what justice concern look like, scholars have looked into the policy, standardization, and civil society discourses around technology [6, 57, 67]. Each area has extensive bodies of research but for this paper we will primarily engage with literature that explored the history and roles of civil society, specifically digital rights organizations, to theorize about how these groups understand the nexus between climate justice and digital rights. Civil society organizations are seen to function as a watchdog, scrutinizing political processes, representing a collective citizen voice and influence social norms [41]. Ascribing the role of challenging and shifting power to a heterogeneous group of organization; both in size, from grassroots organizing to international Non-governmental organizations (NGOs), and in issues area, from human rights concerns to the right to environmental protection. The emergence of the internet gave rise to a new type of civil society organization, digital rights organization, who challenge surveillance and mass data collection, defend fundamental rights online, and use technology for social change [52].

The digital rights movement emerged from a small group of individuals who had an interest in technology, anti-surveillance tools and discourse, and promoted the right to privacy, anonymity, and autonomy. Since its early days the internet and digital technologies have gained prominence and is increasingly setting the rules for how society is organized [23] as such digital rights have become a cross cutting policy that are a prerequisite to the exercise of fundamental human rights [1]. The friction of digital rights being a right in its own and an enabling right became increasingly apparent in the wake of the Snowden revelations (cf. [45]). Where resistance to surveillance "predominantly centered on techno-legal responses relating to the development and use of encryption and policy advocacy around privacy and data protection" [18]. It was argued that digital rights needed to connect their anti-surveillance struggle with broader social justice agenda's [18]. Connecting across movements raised new questions of representation and accountability, specifically in relation to whose voice counts, whose (in)justice claims are being foregrounded, those that center technology or those that start from the experience of impacted communities [60].

In relation to the climate crisis digital infrastructures and new technologies are promoted as promising tool that can mitigate the impacts of global warming and distribute climate protection [64]. Digital rights critiques on technological developments, digitization policies, and the data economy has given ample evidence to be critical of this hopeful narrative. These insights are barely getting traction as civil society action on the environmental impact of digital infrastructures and new technologies are nascent [30] and require new cross movement collaboration. There is an urgency to move but the global nature of both the environmental and digital rights policy debates and the confinement of specialized knowledge within silo-ed expert communities creates barriers of entry. This paper tries to shed light on the blossoming civil society discussions on the nexus between climate and technology.

2.3 Legal Initiatives in the EU

On 10 March 2020, the European Commission presented their "New Industrial Strategy for Europe," which set out an industrial strategy that would make Europe a globally competitive, green, and digital economy [12]. This transition was "quickly baptized the twin transition" [3] and spurred a number of policy and legislative processes. The Right to Repair [68], the Net Zero Industry Act [29], the specificity's of the Ecodesign directive and the Circular Economy Initiative are being developed under the Green New Deal [10]. The Critical Materials Act [69] falls within The Green Deal Industrial Plan. Within the digital agenda of the EU there is the Artificial Intelligence Act [27], the Digital Markets Act (DMA) [28], and the Digital Services Act (DSA) [26]. Politically these different policy and regulatory frameworks fall firmly within either the Green New Deal or the Digital Agenda for Europe, however, the European Commission expressed the ambition to push for synergies and consistency between their climate and digital ambitions in strategic Foresight Report in 2022 [13]. The European Commission interlinks the green and digital transition as the institution believes that "digital technologies could play a key role in achieving climate neutrality, reducing pollution, and restoring biodiversity" [13].

The European Commission communicated the adoption of a new proposal on the right to repair of goods on the 22nd of March 2023. In their analysis, the European Commission argued that currently the volume of viable products that can be repaired but are discarded result in "35 million tons of waste, 30 million tons of resources and 261 million tons of greenhouse gas emissions in the EU every year" [37]. To achieve the objectives of the Green New Deal the proposal will make it easier and more cost-effective for consumers to repair goods. The current Right to Repair [68] proposal covers only a very limited set of household products (including e.g. household washing machines, tumble dryers, vacuum

cleaners, dishwashers), but in the near future it will also extent to smartphones and tablets [33]. The draft "ecodesign requirements for mobile phones, cordless phones, and slate tablets" pursuant to Ecodesign Directive 2009/125/EC will require phone makers and seller to make these devices energy efficient and durable, easily repairable, and possible to reuse and recycle. It allow consumer to repair individual mobile phone parts, such as the battery, display, cameras, charging ports, microphone and speakers, for five years after the date of end of placement on the mark. Other important developments are the Net Zero Industry Act and the Critical Raw Materials Act. The Net Zero Industry Act [29] is the first industrial policy at EU level dedicated to decarbonisation, security of supply for net-zero technologies and resilience of the energy system, and open strategic autonomy, public order and security considerations. The Critical Raw Material Act [69] sets out to diversifying the EU's imports of strategic raw materials and lessen the dependency on a single third country for individual resources.

In 2021 the European Commission communicated their approach to Artificial Intelligence. In their strategy they propose an industrial plan to promote the development of European AI and a regulatory framework to address the potential risk to the safety and fundamental rights of its citizens. While civil society have demonstrated that the European Commission proposal falls short of actually providing safeguards for some of the most harmful AI uses on people [7], the AI relationship environmental and climate implications of new technologies have largely been ignored [39]. The DSA [26] and DMA [28] aim to create a safer digital space where the fundamental rights of users are protected and to establish a level playing field for businesses [61] . Specifically the DSA [26] will introduce a host of new obligations to intermediaries, such as social media platforms, in relation to disinformation. This can become an important tool for the fight of climate disinformation, that range from "paid speech by the fossil fuel industry, Public Relations (PR) campaigns, greenwashing, climate scepticism, distraction, chaos strategies, or the targeted harassment of climate activists" [30].

This range of legislation's, policies and strategies aim to influence how the digital economy is influenced. In the next section we will discuss the PrivacCamp23 workshop, the panelist and their key points, and the outcomes of the World-Café discussion. After which we will discuss how digital rights actors enter into the discussion on the environmental implications of digital infrastructures through its materiality, they still offer a wider critique of the European Commissions underlying ideology, the Single-Market approach, in their Twin Transition.

3 QUESTIONS, EXPECTATIONS, METHODOLOGY

For this workshop we conceptualized the method of listening to civil society to gain a bottom-up analysis of a social and political problem [73] in two ways. First, PrivacyCamp23, the empirical site for data collection is a space and time where the digital-rights policy community annually convenes. Second, we collected data by providing a structure and prompts for discussion, following an established qualitative methodology in a World-Café format.

3.1 The Audience

The urgency of the climate crisis demands actions from all of us. As argued in Section 2, there are many different entry points into understanding this nexus. To this day research rooted in engineering, economy and law has contributed to the debates. This research takes cue from critical social sciences, specifically Young [73], who argues that academia needs to move beyond a top-down analysis of a problem and listening to social movements, as this will offer different and new insights into the often messy and complicated social reality and the power relations that underpin them.

Our workshop and this paper explores how a nascent community of digital rights policy actors interested in the climate crisis centers climate and environmental considerations in their work [30]. The participants were part of PrivacyCamp23, an event which brings together digital rights advocates, activists as well as academics and policy-makers who actively engage in conversations to address pressing issues of privacy, human rights, and social justice in the digital age. Specific topics discussed at PrivacyCamp are the social justice implications of datafied policing, worker rights in the gig economy, data protection regulation, and regulating the use of spyware. The environmental implications of the internet and digital technologies is an emerging policy area some participants of PrivacyCamp are exploring. Most of the digital rights advocacy groups and activists are not yet actively working on this nexus, but are laying the ground work to develop a baseline "Brussels position" on the intersection of digital rights and environmentalism that is understood across the board of digital rights advocacy and lobbying organizations.

From prior experience we expected that the background, interest, and theory of change of this more policy oriented community is rather different from the LIMITS community.[3] Yet, there are similarities in how problems and solutions are framed. For example, both groups emphasize notions of justice. The LIMITS community largely acknowledges that "most computing work is premised on industrial civilization's default worldview in which ongoing economic growth is both achievable and desirable. This growth-focused worldview, however, is at odds with findings from many other scientific fields, which see growth as deeply problematic for ecological and social reasons" [56]. Notions of degrowth for digitally overserved Global-North economies, advocating business models for digital platforms that acknowledge planetary boundaries and the exploitative nature of digital infrastructures, are largely absent in the policy space. A reason for this could be that the EU's policy is concerned with increasing the competitiveness and growth of European industries and it is understood that there is no political support for narratives that center international justice.[4] Yet, this position has recently received vocal criticism, e.g., with calls for a

[3] With "LIMITS community" we refer to people who scholarly or practically engage with "computing withing limits" ideas and practices [17, 56].

[4] "We have a once in a generation opportunity to show the way with speed, ambition and a sense of purpose to secure the EU's industrial lead in the fast-growing net-zero technology sector. Europe is determined to lead the clean tech revolution." – Ursula von der Leyen, President of the European Commission, 2023-02-01.
"At the cost of repeating myself, funds are finite, debts must be paid back, and the only way we are able to do that is if we are able to grow our economies sustainably. And the legislation that we create here that we vote here is about creating new jobs, new sectors and new industries giving us a competitive edge." – Roberta Matsola, President of the European Parliament, 2023-05-15.

"digital reset" being raised [46] or with the European Parliament's and European Commission's presidents growth rhetoric being directly challenged by Sandrine Dixson-Declève [22] by asserting that "if we need growth, it is a growth in social cohesion".[5]

3.2 Workshop Organization

Following the organizer's requirements, our workshop would last 90 minutes. Our workshop design is driven by the idea of engaging digital right and policy advocates in a discussion that would stimulate positioning topics of interest in a way that goes beyond pointing out how bad certain policy proposals are and how certain risks and mitigations can be included in upcoming tech regulation. Specifically we wanted to highlight and discuss the intersection of the climate crisis and digital right crisis as a complex societal issues that mutually amplify each other. To inspire the workshop participants for this discussion, we prepared five short introductory interventions in a panel setup (cf. Section 4.2 for details). The panel would cover the first 30 minutes of the workshop,

For the remaining 60 minutes we moved to the World-Café setup. A World Café [25] is a structured conversational process where groups of people discuss related topics at several tables. After a certain period of time, 20 minutes in our case, people move to another table. Notes are being taken, in our case on a large flip-chart paper and by two dedicated minute takers, and a facilitator would remain at each table to explain to the arriving group what had been discussed among previous groups at this table. The session was documented through means of self documentation on flip chart paper and observers who functions as note-takers. We proposed four tables with topics to choose from:

- Issue areas that need to be put on the policy agenda
- Key national and European governance space and debates that we can plug into
- Framing(s) around the digital rights and a "green" internet
- Allies and adversaries in the struggle for climate justice and digital equity

As a conscious choice in our planning, participants would visit only three tables but have slightly more time to engage with the three topics they select. We did neither impose group compositions nor assign participants to specific tables.

3.3 Evaluation and Analysis

The research presented here is qualitative in nature and explores narratives, theories of change, and economic, social, and political obstacles as they are perceived by our workshop participants. Therefore, our approach borrows methodology from the humanities [54], specifically narrative approaches that enable an evaluative approach for research projects with a core science communication element [15] and that have previously been proposed as evaluative methods in software engineering [48]. With a focus on the above four themes, our approach was designed to enable participants "to personalize, narrate and reflect on their own experiences [, and to] provide examples or to reflect on specific aspects of their learning experiences from their participation" in policy work and activism. This further allows participants to "raise new topics [...] which could go undetected from quantitative scale instruments" [15].

With this background, we followed a common approach in qualitative research of organizing our data by transcribing workshop notes and flip-chart sheets, and a review and exploration phase where we identify patterns and repeated ideas that emerged. We defined a data encoding that is based on a review of recent and upcoming legislation of the EU (cf. Table 1). We admit that this encoding could be more formal and more comprehensive, albeit this would only be useful in the context of a follow-up workshop with more in-depth discussions. Our discussion then seeks to link workshop conversations and policy discussions into overarching themes, identifying common topics and narratives that future research in the LIMITS community could build upon.

4 THE WORKSHOP

In 2023, PrivacyCamp attracted about 200 in-person participants while more than 600 attended remotely. The event offers a hybrid between panels and workshops, and has several tracks running simultaneously. Participants freely choose to attend sessions following their interests. Our workshop on "The Climate Crisis is a Digital Rights Crisis" attracted a diverse cross-section of PrivacyCamp participants. With about 50 on-site participants,[6] involving professional policy advocates and lobbyists, academics, but also many people with a general interest in technology and its impacts.

Our workshop was designed as a 90-minutes participatory activity with an introduction consisting of five short interventions, about five minutes each, in a panel-like setup (cf. Sect. 4.2 and Fig. 1) to inspire discussions. We then moved on to a World-Café setup (cf. Sect. 4.3 and Fig. 2). Seven people, all of whom are co-authors of this paper, were involved in organizing and facilitating the workshop, taking the following roles:

- Becky Kazansky: Panelist & Facilitator
- Claire Fernandez: Minutes & Participant
- Fieke Jansen: Organizer & Panelist
- Harriet Kingaby: Panelist & Facilitator
- Jan Tobias Mühlberg: Moderator & Facilitator
- Merve Gülmez: Minutes & Participant
- Narmine Abou Bakari: Panelist & Facilitator

4.1 Participant Consent

PrivacyCamp is a public event and all participants were informed upfront about the event being documented and summarized by the organizers, with several sessions being recorded or live-streamed. Participants had the option to opt out of pictures of them being taken, which was enforced by means of colored neckbands and badges. We highlighted in the description of our workshop that "we will summarize and post-process the discussion to build upon it in the future," and mention in the workshop introduction and conclusion that we aim to publish a report and discussion of the results. Minute takers were openly present throughout the event.

Our minutes as well as this discussion of the workshop contain no personally identifying information or attribution of statements to individual participants, except for those made by the panelists

[5] "Beyond Growth" conference at the European Parliament, 2023-05-15: https://www.beyond-growth-2023.eu/

[6] As a choice of the event organizers, workshops at PrivacyCamp 2023 were not available for remote participation.



Figure 1: View of the panel part of the workshop, taken from the center of the room. In front of the audience, Fieke Jansen (participating remotely, on the laptop screen), Jan Tobias Mühlberg (to the left of the screen) and Becky Kazansky (to the right of the screen) are visible. Picture: Omar Havana, CC-BY 4.0.

and co-authors of this paper. All photographic documentation in this paper has been obtained following the consent rules of the event and previously published under a Creative-Commons license on the PrivacyCamp website. We followed institutional practice on data minimization and data protection, and did not seek additional approval from our Institutional Review Boards regarding this work.

4.2 Panelists and Key Points

To introduce the workshop, Jan Tobias Mühlberg, security and privacy researcher at Université Libre de Bruxelles, proposed a framing for sustainability in digital infrastructures that centers environmental and climate justice, opening up questions around advocacy, policy, and digital rights in these sustainable digital infrastructures. With this we link our workshop to previous PrivacyCamp panels which focused on the tension between activist movement ethics and digital platform ethics, risks of de-platforming, but also the need for easy interaction and outreach in the activist space. These conversation have evolved to now also includes questions around online misinformation, and AI governance. It is directly linked to topics discussed at PrivacyCamp 2023, e.g., AI in discriminatory border technologies, which are being used to facilitate illegal push-backs and outright murder of people displaced by the consequences of climate change, such as droughts and military conflict. The raw materials used to create these tools is often extracted from these people's land, European approached to migration management even exacerbating the harm caused by climate change. To build momentum for change, we must approach the issue from different angles. We must address extractivism, the criminalization of people affected by climate change, as well as climate activists, which requires new approaches and narratives that emphasize systemic change in platform governance, surveillance, and policy around sustainability and environmental impacts.

Narmine Abou Bakari is the Circular Tech Economy Campaigner Greens/EFA at the European Parliament, working on the environmental impacts of digital technologies. Narmine started her statement with presenting some empirical evidence of how tech companies negatively impact the environment. For example, in 2020 tech companies consumed 9% of our global electricity and are right now far away from the net-zero metric. According to another comparison, the energy consumption of cryptocurrency mining is equivalent to that of the entire country of Argentina. Her other main points related to the *right to repair* and *Circular economy*. She emphasized that we should have a right to sustain our devices for a longer period of time and reuse our hardware. While the *circular economy* is important for creating sustainable products and reducing waste, we face the end-of-support issue: software barriers reduce the lifespan of digital devices. The current economy, where the manufacturer or operating systems can remotely access and control digital devices to push updates, creates incentives replace devices before their end of life as updates can slow down devices without informing the end user. This issue should be a more prominent in policy debates now that more and more devices are becoming software-driven. To this end, there should be more transparency between companies and users. Users should have more freedom to sustain their devices or repair them.

Harriet Kingaby from the Conscious Advertising Network and ACT Climate Labs, works at the intersection of advertising, climate change, and misinformation. She mentioned that the disinformation economy is a booming industry, worth around $235m USD a year according to the Global Disinformation Index [38]. It takes advantage of the opacity of the digital advertising system online, worth $614 billion USD in 2022 [66]. When combined with social media structures [59], including algorithms which reward engagement [71], or the reach of broadcast channels, has created incentives [8] to produce extreme and misleading content. Here Harriet argued that we need to look at the actors envolved in the disinformation economy. Advertising funds most media, including social media platforms, it often bankrolls misinformation. Advertising tools are also used to increase the reach of disinformation, with companies eager to promote their products or brands using tactics such as greenwashing [20], or lobby against policies via front groups [21]. To combat these issue, we need inclusive definitions for what constitutes mis and disinformation around key topics, such as the one developed by the Climate Action Against Disinformation coaliton [19] for climate disinformation, which is based on scientific consensus, misrepresentation of science, and solutions and was developed by experts from broad backgrounds. Harriet concluded by stating that we also need to regulate tech platforms to incorporate these definitions in their monetisation policies, and provide greater transparency. She emphasized the need for interdisciplinary collaboration to address climate change and disinformation.

Becky Kazansky is a postdoctoral researcher at the University of Amsterdam, where she is working on a project critically investigating the promises of 'AI for climate'. She previously led a research project with international nonprofit organisation The Engine Room exploring the intersections of digital rights and climate justice [43]. Becky shared highlights from this project, which drew on a series of workshops and 20 interviews with digital rights advocates, land

rights defenders, environmental lawyers, environmental data specialists, and energy transition specialists from around the world. Becky highlighted five overlapping priority areas where important strides are already being made (but more solidarity and support are needed) to advance more just visions of technology that serves people and planet, including work to advance a more sustainable internet; digital security and safety for movements; disinformation and information access; environmental data, and migration justice. Becky honed in on two main takeways from the project. First, she highlighted how important the notion of extractivism is for thinking across issues related to technology, planet, and climate, drawing links between extraction as data surveillance (on the digital rights side) and extraction as a continued colonial process perpetuating harms against people and their territories (on the climate and environmental side). Becky also emphasized the need to be critical about what 'sustainable' means, for whom, pointing to the misleading claims of carbon neutrality made by big tech companies in recent years. Amidst concerns with misleading and false climate tech solutions (on which there was a related panel discussion at PrivacyCamp) [42], Becky argued that the digital rights movement needs to get specific about its goals and commitments, and make sure it acts in solidarity with the global climate justice movement.

Fieke Jansen is a postdoc researcher at critical infrastructure lab at the University of Amsterdam, working on environmental implications of internet infrastructures. She is the co-organiser of the Green Screen climate justice and digital rights coalition, a group of funders and practitioners looking to build bridges across the digital rights and climate justice movements. Fieke shared insight from this project, which started over two years ago with the question how can we responsibly center climate and environmental concerns in the digital rights movement [40]. There is a need to make the nexus tangible, articulate why communities and movements should care, find common ground, and define the different roles. For example, mining to support the digital supply chain is having negative impacts on communities in the Global South. Indigenous and local communities are confronted with pollution, shortage of water, and threats to their safety. The latter has become a privilege in the digital age, with certain individuals and groups facing greater physical and digital risks than others. In building actionable agenda's on this nexus it is imperative to keep reflecting on whose voices and priorities.

4.3 World Café and Outcomes

In this section, we summarized the outcomes of the World-Café discussion, the main part of the workshop. Figure 2 shows an example of how participants interact with each other and Figure 3 is a full outcome of their written thoughts. An overview of the different discussion points is provided in Table 1.

Discussion Table A: Issue areas that need to be put on the policy agenda. There are several issue areas that urgently need to be put on the policy agenda to address the challenges. These include digital extraction, manufacturing processes, supporting vulnerable communities, prioritizing health and safety, improving dissemination and access to information, promoting collaboration and stakeholder involvement, addressing environmental concerns, and promoting diligence and cooperative accountability and responsibility.



Figure 2: World Café. Narmine Abou Bakari (to the right) discussing with five other workshop participants around a table. A flipchart paper is available for taking notes. Picture: Omar Havana, CC-BY 4.0.

Discussion Table B: Key national and European governance space and debates that we can plug into. There are several key national and European governance spaces and debates that we can plug into to advance our goals of promoting sustainability and social justice. At the European level, some of the most important debates include the right to repair, energy consumption, The Corporate Sustainability due diligence directive [14] and the ideal of a Just Transition Mechanism [11]. At the national level, social-economic council, local debates, urban design (around the concept of "smart city") are important debates. Finally, there are important international forums and institutions that we can engage with, including COP27[7], the IPCC[8], the Human Rights working group and special procedures.

Discussion Table C: Framing(s) around the digital rights and a "green" internet. As shown in Figure 3, Discussions at this station included critical introspection about the words and frameworks used to talk about and make sense of climate and environmental crises. The group discussed the meaning of 'green' and how the term 'green tech' can conceal the unjust and extractive processes that go into the production of technologies that are often framed as being sustainable, or supportive of sustainability. One recurring question was whether there is any green tech or 'clean' tech that does not ultimately perpetuate harmful dynamics. Discussants connected this question to matters of scale and the differences between individualized and collective approaches to tackling both digital rights and climate issues, with an argument made for the need to reframe digital rights to focus less on individual ideas of freedom and more on collective notions of justice. Discussants connected this argument to emerging frameworks around a circular economy and degrowth, thinking of these as pathways to aligning technological production more with equity and justice.

[7] 27th Conference of the Parties of the UNFCCC: https://cop27.eg/
[8] Intergovernmental Panel on Climate Change: https://www.ipcc.ch/

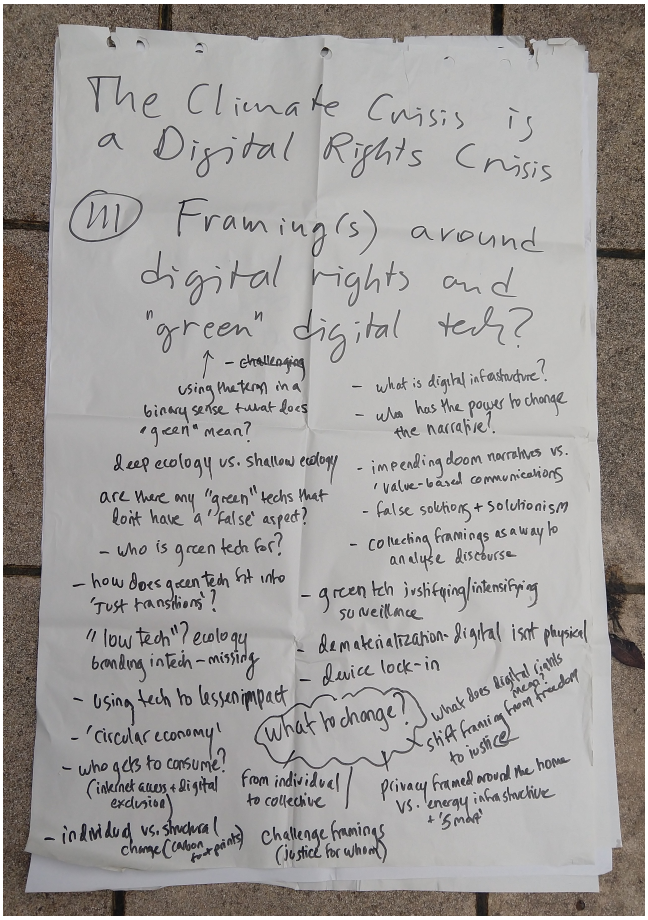

Figure 3: A picture of the final flipchart sheet from Table C, "Framing(s) around the digital rights and a 'green' internet". A transcript of the flipchart is provided in Table 1; at the bottom there is a "What to change?"-cloud visible, around which the participants synthesized their discussion.

Discussion Table D: Allies and adversaries in the struggle for climate justice and digital equity. Some of our key allies include rights and activist groups, civil society organizations (CSOs) and autonomous regional organizations (AROs), grassroots organizations (such as those focused on healthcare), small-scale farmers in the Global South and EU, indigenous people, and scientists who support our cause. There are also adversaries including those who spread misinformation and independent scientists who may not share our views. Other adversaries include unions, banking institutions, media outlets, workers who prioritize their own interests over the environment, and those who seek to limit freedom of speech and expression. Some groups may fall into both categories, such as media workers who may provide valuable coverage of our cause but also perpetuate harmful narratives. Consumer groups, local and national governments, and banking institutions may also be both allies and adversaries, depending on their policies and actions. Overall, the discussion on Table D focused a lot on interactions between different actors, which we cannot reproduce here in its entirety. And overview of the actors highlighted by the participants is given below:

- Civil Society Organizations
- Grassroots movements
- Small-scale farmers (incl. Global South)
- Corporate/Political Greenwashing
- Indigenous People
- Scientists
- Misinformation
- Freedom of expression/speech advocates
- Labor Unions
- Banks
- Media
- Workers
- Consumer Groups
- Local/National Governments

5 DISCUSSION

In the Section 2, we discussed that there is an emerging body of research that aims to understand the environmental and climate impact of digital infrastructures and new technologies. In this emerging field the questions of how the immaterial layer of these technologies, the economic logic(s), policies, and framing that govern it, will determine what our futures will look like is still under explored. To contribute to the ideas behind "Computing within Limits" (or better: within planetary boundaries), conversations we report on offer initial insights into how civil society, specifically digital rights organizations, frame issues of (environmental) sustainability, and engage with the landslide of new European policies that aim to make the EU a globally competitive and green digital economy. In Table 1 we present the discussions in relation to the different very recent and upcoming legislative proposals of the European Commission. This relational table foregrounds that civil society discussions on the nexus of environment and technology can not be mapped one on one to individual regulatory processes. Rather, these discussions offer a more fundamental critique of the underlying ideology that drive the European Commission's actions. The EU has grounded all digital or climate regulation in a Single-Market approach, and as such the European project remains mainly an economic one. The European Commission rhetoric around twinning the digital and the green transitions is a clear illustration of how both transition should first and foremost serve European economic interest. This makes it difficult for advocates and civil society groups to weave actual human or planet protection measures into these legislation approaches because there is currently no platform or public interest in a discourse that highlights extra-European interests with energy budgets for a decent living for all [53] and accounting for historic responsibility for climate change [35].

What stood out in the workshop is that privacy-oriented civil society actor are interested in discussing these matters. While doing so, our workshop participants primarily foreground the environmental and climate implications of technology in relation to its materiality; namely, energy consumption and extraction of critical raw materials, including social implications of this materiality. Criticism of European digital extractivism and the exploitation of non-Europeans as technological testing grounds, e.g. in the context

Table 1: Mapping discussion points to recent to upcoming legislative initiatives in the EU. Colors indicate at which World-Café table a discussion evolved: ● Table A: Issue areas that need to be put on the policy agenda; ● Table C: Framing(s) around the digital rights and a "green" internet; ● Summary questions generated at table C. Table B, "key national and European governance space and debates that we can plug into" informed the choice of legal initiatives. We do not include Table D "Allies and adversaries in the struggle for climate justice and digital equity" here because the interests of stakeholders there intersect, to some extent, with all legislative initiatives. The columns "other" and "none" indicate that there are legislative proposals that were not explicitly mentioned by our participants (e.g., European industrial strategy) that touch upon the issue, or that there is currently no legislation that addresses specific core points mentioned by the participants, respectively. In many cases the discussions at the tables were much more involved and reflected than what can be presented here. E.g., it was highlighted that many actors cannot be uniquely classified as allies or adversaries as they are driven by agendas beyond the scope of climate and digital rights.

Topics Mentioned or Discussed	Digital Services Act	Digital Markets Act	Artificial Intelligence Act	Right to Repair	Circular Economy	Eco Design	Raw Materials Act	other	none
Digital extraction	◓	◓	◓						●
Equitable access to digital resources	◓	◓							
Health & Safety	●	●	●				●		
Impacts of manufacturing processes				●	●	●	●	●	
Raw materials, dependence and choices					●		●		
Impacts on communities & vulnerable people (EU vs. non-EU)	●	●	●						●
Disconnect in policy making									●
Energy Privacy & Fairness	●							●	
Due diligence & Corporate accountability								●	
Collaboration of stakeholders									●
Decentering individuals, business models towards systemic change									●
Environmental impacts			●		●	●	●	●	
Offshoring (services, processing, storage)								●	
Terminology, "green", "sustainable", etc.					●				●
Deep ecology vs shallow ecology (or sustainability)									●
Is there green tech that doesn't come with false promises?									●
Who is green tech for?									●
How does green tech fit into green just transitions?									●
Low tech solutions – there's no branding or marketing				●	●		●		●
Using technology to reduce impacts								●	
Circular economy				●	●	●	●		
Who gets to consume (internet access + digital exclusion)	◓	◓							●
Individual vs structural change (carbon footprints)								●	●
What is digital infrastructure?								●	
Who has the power to change narrative									
Impending doom narratives vs. "value-based communications"									●
False solutions & tech solutionism									●
Collecting framings as a way to analyze discourse									
Green technology justifying/intensifying surveillance	●	●	●		◓	◓			
Dematerialization: digital is not physical					●	●			
Device & platform lock-in				●		●			
Moving from individual to collective responsibility.									●
What does digital rights mean across debates?	●	●							
Shift framing from freedom to justice.									●
Privacy framed around the home vs. privacy in smart infrastructures.	●		●						
Challenge framings: justice, and for whom?									●

of migration management [55], were also present in the debate. Overall, however, the political economy of the technology industry, information capitalism, is less prevalent in this debate.

This indicated that participants agreed that the climate crisis is a digital rights concern and that these issue should go beyond core digital rights concerns, like privacy, data protection, encryption, and net neutrality. Engaging with the materiality of digital infrastructures might even be considered a necessity as it will be difficult for the digital rights community to meaningful engage on this nexus without articulating and addressing the material the impact of digital technology have on the most vulnerable communities and their lands. There is a recognition that issues of extractivism, materiality of the technologies and where they come from, the invisible labor and disastrous consequences their infinite growth has led to and who these very big environment and climate harms impact. The recognition by participants in this PrivacyCamp workshop is an encouraging step, but there is also an overwhelming sense of where to start. Max Liboiron's book "Pollution is Colonialism" [49] offers a critique and practice that can inspire the digital rights policy community to connect pollution and governance related to extraction of raw materials, land, water and energy use for manufacturing and operating digital infrastructures, and e-waste to ongoing colonial relations to Land.

What is striking is that the political economy of digital infrastructures and new technologies were not prominently mentioned in the workshop, and neither where the European Commission's industrial strategy and their adjacent funding mechanisms (cf. Table 1, columns "other" and "none"). This could in part be explained by the digital rights community's primary toolbox, where in Brussels they seek to make change through influencing the regulatory processes. The workshop participants identified opportunity for green and digital NGOs to learn from each other and reinforce each other's demands by calling out the false solutions [42], de-center the industrial-military complex demands and center their demands. This indicates that there is a deeper understanding and interest in advocating for structural changes that center people and planet over profit and capital in the Twin transition. With the expansion of Big Tech powers, the digital rights field's approaches has moved beyond the traditional digital rights issues, to include structural technological harms, challenge the industries abuse of power - including Big Tech's surveillance advertising business model - and called out the links between the surveillance industry, Big Tech growth strategy into public infrastructure and the development of "Artificial Intelligence". The climate movements approaches that seek to dismantle industrial strategies and engages with defunding mechanisms would be very complimentary to these actions [44].

To move beyond critique there are attempts to formulate what the future technology and infrastructure the digital rights groups want, and to create bridges with social justice and human rights groups, corporate accountability and climate justice groups. So far, however, the impact on centering "sufficiency" or "alternative economic models for digital technology" has been timid. Centering justice would support bridging efforts [18] through an explicit recognition that both digital harms and climate crisis impact marginalized communities in Europe, as well as countries of the Global South which are the least responsible for the rise of Big Tech or Big Oil. A civil society just alternative to the twinning of digital and green transition would also recognize the colonial roots of the crises we face and the continuum between colonial exploitation of the past and the current material and immaterial extractions for digital technology demands, as the collective process to decolonising digital rights co-led by the Digital Freedom Fund and EDRi suggests [24, 31].

6 SUMMARY & CONCLUSIONS

At #PrivacyCamp23, a major event in the Digital Right space that takes place annually in Brussels, Belgium, we organized a workshop on "The Climate Crisis is a Digital Rights Crisis". With the goal to understand how digital right policy advocates and lobbyists see the intersection between the climate and ecological emergency and the digital rights crisis, we set up a World Café to explore different aspects of this intersection: issue areas for policy making, governance spaces and debates, framing(s), and allies and adversaries in the debate. In this paper we summarize and discuss the outcomes of this workshop and provide initial insights into how civil society, specifically digital rights organizations, frame the issues and engage with the wealth of new European policies that aim to make the EU a globally competitive and green digital economy. We discover that our participants are well engaged with European regulations such as the upcoming AI Act, but much less so with European industrial strategy. We also see that, since the EU's strategic and regulatory approaches are dominated by emphasize the competitiveness of European industries as a key objective, there are very few spaces where an impactful public discourse on digital economies that center sufficiency and (climate) justice could be held. Yet, the workshop participants did highlight, e.g, the need for calling out false digital climate solutions and to defund industries that exacerbate structural technological harms and environmental impacts. We conclude that ideas for structural change and to recognize the colonial root causes of the crises we face, are present amongst European digital rights advocates, and so is the understanding that collaboration with the climate justice movement and to work towards joint proposals that address these crises is essential. However, the governance- and interaction spaces for this discourse to happen and to be impactful are not developed yet.

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REFERENCES

[1] Association for Progressive Communications. 2022. Digital rights as a prerequisite to the exercise of fundamental human rights. Statement. https://www.apc.org/en/news/digital-rights-prerequisite-exercise-fundamental-human-rights

[2] E. Bender, T. Gebru, A. McMillan-Major, and S. Shmitchell. 2021. On the Dangers of Stochastic Parrots: Can Language Models Be Too Big. *In Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 610—-623. https://doi.org/10.1145/3442188.3445922

[3] S. Bianchini, G. Damioli, and C. Ghisetti. 2023. The environmental effects of the "twin" green and digital transition in European regions. *Environ Resource Econ* 84 (2023). https://doi.org/10.1007/s10640-022-00741-7

[4] P. Brodie. 2020. Climate extraction and supply chains of data. *Media, Culture & Society* (2020), 1—-20. https://doi.org/10.1177/0163443720904601

[5] Adrienne Buller. 2022. *The value of a whale: on the illusions of green capitalism* (first ed.). Manchester University Press, Manchester.

[6] Corinne Cath. 2021. The technology we choose to create: Human rights advocacy in the Internet Engineering Task Force. *Telecommunications Policy* 45, 6 (2021). https://doi.org/10.1016/j.telpol.2021.102144

[7] S. Chander and E. Jakubowska. 2021. Civil society calls on the EU to put fundamental rights first in the AI Act. https://edri.org/our-work/civil-society-calls-on-the-eu-to-put-fundamental-rights-first-in-the-ai-act/

[8] CNN. 2020. The Macedonia Story. https://money.cnn.com/interactive/media/the-macedonia-story/.

[9] Julie E. Cohen. 2019. *Between Truth and Power.* (first ed.). Oxford University Press, New York.

[10] European Commission. 2019. The European Green Deal sets out how to make Europe the first climate-neutral continent by 2050, boosting the economy, improving people's health and quality of life, caring for nature, and leaving no one behind. https://ec.europa.eu/commission/presscorner/detail/en/ip_19_6691

[11] European Commission. 2019. The Just Transition Mechanism: making sure no one is left behind. https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1145.

[12] European Commission. 2020. Making Europe's businesses future-ready: A new Industrial Strategy for a globally competitive, green and digital Europe. https://ec.europa.eu/commission/presscorner/detail/en/ip_20_416

[13] European Commission. 2022. 2022 Strategic Foresight Report: twinning the green and digital transitions in the new geopolitical context. https://ec.europa.eu/commission/presscorner/detail/en/ip_22_4004

[14] European Commission. 2022. Just and sustainable economy: Commission lays down rules for companies to respect human rights and environment in global value chains. https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1145.

[15] Natasha Constant and Liz Roberts. 2017. Narratives as a mode of research evaluation in citizen science: understanding broader science communication impacts. *Journal of science communication.* 16, 4 (2017), A03.

[16] Kate Crawford. 2021. *Atlas of Ai: power, politics, and the planetary costs of artificial intelligence.* Yale University Press, New Haven.

[17] Marloes De Valk. 2021. A pluriverse of local worlds: A review of Computing within Limits related terminology and practices. *LIMITS Workshop on Computing within Limits* (June 2021). https://doi.org/10.21428/bf6fb269.1e37d8be

[18] L. Dencik, A. Hintz, and J. Cable. 2016. Towards data justice? The ambiguity of anti-surveillance resistance in political activism. *Big Data & Society* 3, 2 (2016), 1–11. https://doi.org/10.1177/2053951716679678

[19] Climate Action Against Disinformation. [n.d.]. What is climate mis/disinformation? https://caad.info/what-is-climate-disinformation/.

[20] Climate Action Against Disinformation. 2023. Big Tech facilitating fossil fuel greenwashing. https://caad.info/report/big-tech-facilitating-fossil-fuel-greenwashing/.

[21] Climate Action Against Disinformation. 2023. Deny, Deceive, Delay (Vol 2). https://caad.info/report/deny-deceive-delay-vol-2/.

[22] Sandrine Dixson-Declève, Owen Gaffney, Jayati Ghosh, Jørgen Randers, Johan Rockström, and Per Espen Stoknes. 2022. *Earth for all: a survival guide for humanity: a report to the Club of Rome (2022), fifty years after The limits to growth (1972).* New Society Publishers, Gabriola Island, British Columbia, Canada.

[23] K. Easterling. 2014. *Extra-Statecraft: The Power of Infrastructure Space.* (first ed.). Verso, London and New York.

[24] EDRi. 2023. Decolonising digital rights. https://edri.org/what-we-do/decolonising-digital-rights/

[25] Janice Elliott. 2005. *Participatory methods toolkit: a practitioner's manual.* King Baudouin Foundation / Flemish Institute for Science and Technology Assessment, Brussels. OCLC: 927685917.

[26] European Commission. 2020. Proposal for a Regulation on a Single Market for Digital Services (Digital Services Act). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0593 Accessed: April 3, 2023.

[27] European Commission. 2021. Proposal for a Regulation of the European Parliament and of the Council on a European Approach for Artificial Intelligence. Official Journal of the European Union. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0206

[28] European Union. 2020. Proposal for a Regulation of the European Parliament and of the Council on contestable and fair markets in the digital sector (Digital Markets Act). https://ec.europa.eu/info/publications/proposal-regulation-european-parliament-and-council-contestable-and-fair-markets-digital-sector-digital-markets-act_en Accessed: April 3, 2023.

[29] European Union. 2021. Net Zero Industry Act. https://ec.europa.eu/clima/policies/strategies/2050_en Accessed: April 3, 2023.

[30] K. Fritsch, F. Jansen, and M. Richman. 2023. Green screen: Digital rights and climate justice. An event report. Ariadne Foundation. https://www.ariadne-network.eu/wp-content/uploads/2023/03/Final_event_report_DR_x_CJ_Berlin_1.pdf

[31] Digital Freedom Fund. 2023. Decolonising digital rights. https://digitalfreedomfund.org/decolonising/

[32] Jennifer Gabrys. 2014. Powering the digital: From energy ecologies to electronic environmentalism. (2014).

[33] Cristina Ganapini. 2023. Not yet accessible, affordable nor mainstream: campaigners tighten the screw on new EU Right to Repair proposal. https://repair.eu/news/not-yet-accessible-affordable-nor-mainstream-campaigners-tighten-the-screw-on-new-eu-right-to-repair-proposal/

[34] K. Hao. 2019. Training a Single AI Model Can Emit as Much Carbon as Five Cars in Their Lifetimes. https://www.technologyreview.com/2019/06/06/239031/training-a-single-ai-model-can-emit-as-much-carbon-as-five-cars-in-their-lifetimes/

[35] Jason Hickel. 2020. Quantifying national responsibility for climate breakdown: an equality-based attribution approach for carbon dioxide emissions in excess of the planetary boundary. *The Lancet Planetary Health* 4, 9 (Sept. 2020), e399–e404. https://doi.org/10.1016/S2542-5196(20)30196-0

[36] Mél Hogan. 2015. Data flows and water woes: The Utah data center. *Big Data & Society* (2015), 1—-12. https://doi.org/0.1177/20539517155924299

[37] Representation in Malta. 2023. Right to repair: Commission introduces new consumer rights for easy and attractive repairs. https://malta.representation.ec.europa.eu/news/right-repair-commission-introduces-new-consumer-rights-easy-and-attractive-repairs-2023-03-22_en

[38] Global Disinformation Index. 2019. The Quarter Billion Dollar Question: How is Disinformation Gaming Ad Tech? https://www.disinformationindex.org/research/2019-9-1-the-quarter-billion-dollar-question-how-is-disinformation-gaming-ad-tech/.

[39] Fieke Jansen. 2020. The EU is ignoring AI's effect on the climate crisis. https://www.euractiv.com/section/digital/opinion/the-eu-is-ignoring-ais-effect-on-the-climate-crisis/

[40] Fieke Jansen. 2022. Framing the climate crisis as a digital rights issue. https://www.thegreenwebfoundation.org/news/framing-the-climate-crisis-as-a-digital-rights-issue/

[41] H. Johansson and J. Lee. 2014. Bridging the Gap: How do EU-Based Civil Society Organisations Acquire Their Internal Representation? *Voluntas* 25 (2014), 405–424. https://doi.org/10.1007/s11266-012-9343-4

[42] B. Kazansky, S. Finnegan, and M. Romano. 2023. Solidarity not solutionism: Wayfinding just paths for digital infrastructure that serves the planet. https://www.apc.org/en/news/solidarity-not-solutionism-wayfinding-just-paths-digital-infrastructure-serves-planet

[43] B. Kazansky, M. Karak, T. Perosa, Q. Tsui, and S. Baker. 2022. At the confluence of digital rights and climate & environmental justice. https://www.theengineroom.org/wp-content/uploads/2022/07/TER-Final-Report-07-07-22.pdf

[44] B. Kazansky, M. Karak, T. Perosa, Q. Tsui, and S. Baker. 2023. At the confluence of digital rights and climate & environmental justice; A lanscape review. https://www.theengineroom.org/wp-content/uploads/2022/07/TER-Final-Report-07-07-22.pdf

[45] Susan Landau. 2013. Making Sense from Snowden: What's Significant in the NSA Surveillance Revelations. *IEEE Security & Privacy* 11, 4 (July 2013), 54–63. https://doi.org/10.1109/MSP.2013.90

[46] Steffen Lange, Tilman Santarius, Lina Dencik, Tomas Diez, Hugues Ferreboeuf, Stephanie Hankey, Angelika Hilbeck, Lorenz M. Hilty, Mattias Höjer, Dorothea Kleine, Johanna Pohl, Lucia A. Reisch, Marianne Ryghaug, Tim Schwanen, and Philipp Staab. 2023. *Digital Reset, Redirecting Technologies for the Deep Sustainability Transformation.* oekom Verlag. https://doi.org/10.14512/9783987262463

[47] S. Laser, A. Pasek, E. Sørensen, M. Hogan, M. Ojala, J. Fehrenbacher, M. Hepach, L. Celik, and K. R. Kumar. 2022. The environmental footprint of social media hosting: Tinkering with Mastodon. *European Association for the Study of Science and Technology* 41, 3 (2022), 1—-12. https://doi.org/0.1177/20539517155924299

[48] Per Lenberg, Robert Feldt, Lars Göran Wallgren Tengberg, Inga Tidefors, and Daniel Graziotin. 2017. Behavioral software engineering-guidelines for qualitative studies. *arXiv preprint arXiv:1712.08341* (2017).

[49] Max Liboiron. 2021. *Pollution Is Colonialism.* Duke University Press. https://doi.org/10.1515/9781478021445

[50] S. Makonin, L.U. Marks, R. Przedpełski, A. Rodriguez-Silva, and ElMallah. R. 2022. Calculating the Carbon Footprint of Streaming Media: Beyond the Myth of Efficiency. *8th Workshop on Computing within Limits.* https://doi.org/10.21428/bf6fb269.7625cc76

[51] S. Makonin, L.U. Marks, R. Przedpełski, A. Rodriguez-Silva, and ElMallah. R. 2022. Strategies for Degrowth Computing. *8th Workshop on Computing within Limits*. https://doi.org/10.21428/bf6fb269.04676652

[52] Stefania Milan. 2016. *Liberated Technology: Inside Emancipatory Communication Activism*. MIT Press, 107–124. https://ssrn.com/abstract=2880411 Accessed on April 3, 2023.

[53] Joel Millward-Hopkins, Julia K. Steinberger, Narasimha D. Rao, and Yannick Oswald. 2020. Providing decent living with minimum energy: A global scenario. *Global Environmental Change* 65 (Nov. 2020), 102168. https://doi.org/10.1016/j.gloenvcha.2020.102168

[54] Haradhan Kumar Mohajan et al. 2018. Qualitative research methodology in social sciences and related subjects. *Journal of economic development, environment and people* 7, 1 (2018), 23–48.

[55] Petra Molnar. 2020. Technological Testing Grounds: Migration Management Experiments and Reflections from the Ground Up. https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf

[56] Bonnie Nardi, Bill Tomlinson, Donald J. Patterson, Jay Chen, Daniel Pargman, Barath Raghavan, and Birgit Penzenstadler. 2018. Computing within limits. *Commun. ACM* 61, 10 (2018), 86–93. https://doi.org/10.1145/3183582

[57] Jedrek Niklas and Lina Dencik. 2021. What rights matter? Examining the place of social rights in the EU's artificial intelligence policy debate. *Internet Policy Review* 10, 3 (2021). https://doi.org/10.14763/2021.3.1579

[58] Daniel Pargman, Aksel Biørn-Hansen, Elina Eriksson, Jarmo Laaksolahti, and Markus Robèrt. 2020. From Moore's Law to the Carbon Law. In *Proceedings of the 7th International Conference on ICT for Sustainability*. ACM, Bristol United Kingdom, 285–293. https://doi.org/10.1145/3401335.3401825

[59] Irene Pasquetto. 2022. Social Media Algorithms and the Infrastructure of Disinformation. https://publicengagement.umich.edu/social-media-algorithms-and-the-infrastructure-of-disinformation/.

[60] S. Peña Gangadharan and J. Niklas. 2019. Decentering technology in discourse on discrimination. *Information, Communication & Society* 23, 2 (2019), 882–899. https://doi.org/10.1080/1369118X.2019.1593484

[61] Eliska Pirkova. 2022. The Digital Services Act: your guide to the EU's new content moderation rules. https://www.accessnow.org/digital-services-act-eu-content-moderation-rules-guide/

[62] A. Rasoldier, J. Combaz, Marquet Girault, A., K., and S. Quinton. 2022. How Realistic Are Claims about the Benefits of Using Digital Technologies for GHG Emissions Mitigation? *8th Workshop on Computing within Limits*. https://doi.org/10.21428/bf6fb269.6d7bd21b

[63] Julia Rone. 2023. The shape of the cloud: Contesting date centre construction in North Holland. *New Media & Society* (Jan. 2023), 146144482211459. https://doi.org/10.1177/14614448221145928

[64] Tilman Santarius. 2022. Climate justice and digitalization: A plea to consider broader socio-economic implications of digitalization and climate change. *GAIA - Ecological Perspectives for Science and Society* 31, 3 (Oct. 2022), 146–150. https://doi.org/10.14512/gaia.31.3.4

[65] Md A.B. Siddik, A. Shehabi, and Marston. L. 2021. The Environmental Footprint of Data Centers in the United States. *Environmental Research Letters* 16, 6 (Jan. 2021). https://doi.org/10.1088/1748-9326/abfba1

[66] Statista. 2023. Digital Advertising – Worldwide. https://www.statista.com/outlook/dmo/digital-advertising/worldwide.

[67] Niels ten Oever. 2021. This is not how we imagined it": Technological affordances, economic drivers, and the Internet architecture imaginary. *New Media & Society* 23, 2 (2021), 344–362. https://doi.org/10.1177/1461444820929320

[68] European Union. [n.d.]. EU Right to Repair Act. https://www.europarl.europa.eu/news/en/press-room/20210303IPR98613/right-to-repair-meps-adopt-report-calling-for-more-sustainable-products Accessed: April 3, 2023.

[69] European Union. 2021. Critical Materials Act in the European Union. https://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en Accessed: April 3, 2023.

[70] J. Velkova. 2021. Thermopolitics of data: Cloud infrastructures and energy futures. *Cultural Studies* 35, 4-5 (2021), 1—-21. https://doi.org/10.1080/09502386.2021.1895243

[71] Soroush Vosoughi, Deb Roy, and Sinan Aral. 2018. The spread of true and false news online. *Science* 359, 6380 (2018), 1146–1151. https://doi.org/10.1126/science.aap9559 arXiv:https://www.science.org/doi/pdf/10.1126/science.aap9559

[72] Eric Williams. 2004. Energy intensity of computer manufacturing: Hybrid assessment combining process and economic input - Output methods. *Environmental Science and Technology* 38, 22 (2004), 6166–6174. https://doi.org/10.1021/es035152j

[73] Iris Marion Young. 1990, 2011. *Justice and the Politics of difference*. Princeton University Press. Princeton. OCLC: 927685917.

[74] E. Zuckerman. 2014. The Internet's Original Sin. https://www.theatlantic.com/technology/archive/2014/08/advertising-is-the-internets-original-sin/376041/. Accessed: 2023-04-03.