

April 2022

Summary report

Digitalisation, sustainability and environmental justice

Summary of online discussion
forum



Institute for
European
Environmental
Policy



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INSTITUTE FOR ECOLOGICAL
ECONOMY RESEARCH



The **Institute for European Environmental Policy** (IEEP) is a sustainability think tank with offices in Brussels and London. As a not-for-profit research organisation with over 40 years of experience, we are committed to advancing evidence-based and impact-driven sustainability policy across the EU and the world.



The **Institute for Ecological Economy Research** (IÖW) is a leading scientific institute in the field of practice-oriented sustainability research. It devises strategies and approaches for viable, long-term economic activity – for an economy which enables a good life and preserves natural resources.

DISCLAIMER

The content of this report serves only to provide a summary of the inputs submitted by stakeholders to an online discussion forum. The arguments expressed in this report are solely those of the stakeholders who took part in the online forum, and do not reflect the opinion of any other party.

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ACKNOWLEDGEMENTS.



This report was commissioned by the German Environment Agency (UBA) as part of the project "Digitalization and Sustainability at the EU-level" (research code: 3720411010), financed by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and was produced in cooperation with the Institute for Ecological Economy Research (IÖW).

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1. INTRODUCTION & PROJECT BACKGROUND

In the project [“Digitalisation and sustainability at EU level: Opportunities and risks of digitisation for the implementation of the 2030 Agenda at EU level”](#) commissioned by the [German Environment Agency \(UBA\)](#), the [Institute for Ecological Economy Research \(IÖW\)](#) and the Institute for European Environmental Policy (IEEP) have worked together to study the nexus between sustainability and digitalisation and its policy implications at the EU level.

The broader project has to strengthen the German government’s work on a sustainable orientation of digitalisation at the level of the European Union beyond the course set by the German EU Council Presidency in the second half of 2020. This also includes the concept of social and environmental justice, in line with the motto of the 2030 Agenda for Sustainable Development (“Leave No-One Behind”). In order to establish the topic of sustainable digitalisation in European decision-making bodies in the long term and to integrate aspects of social and environmental justice in the process, the project will consult civil society actors and incorporate their views in the project.

This report presents the main outcomes of an online discussion forum for civil society, organised by the IEEP to compile inputs from stakeholders on the intersection between digitalisation, sustainability, and environmental justice. The summary of submitted inputs is reported with the aim of outlining views and suggestions from stakeholders.

1.1 About the online discussion forum

The IEEP organised an online discussion forum to compile inputs from stakeholders on the intersection between digitalisation, sustainability, and environmental justice.

The online forum ran for 8 weeks between November 22, 2021, and January 28, 2022. Information about the e-forum was disseminated through mailing lists, IEEP official website and social media channels.

The aim of the online forum was to gather the views of civil society actors on issues of environmental justice arising in the context of digitalisation and environmental sustainability. The ultimate objective was to develop political recommendations for action based on these outcomes.

The forum was structured around six central themes: (1) Access to environmental information; (2) Participation in environmental decision making; (3) Civil society environmental initiatives; (4) Systemic change; (5) Human rights and

environmental impacts of ICT manufacturing and life cycle; and (6) Justice/Discrimination in digital environmental technologies. The forum was intended to collect inputs from civil society organisations (CSOs) working in the field of environmental sustainability, environmental justice, and/or digitalisation. A main question was proposed for each channel of discussion, accompanied with an explanatory paragraph that shared some background information on the issue at stake. Stakeholders were also given the opportunity to create a new topic of discussion. All inputs are made publicly available [here](#). Registration on the website is required.

Stakeholders were invited to engage in an interactive way by posting regularly and commenting on inputs of other users. To ensure a dynamic forum, IEEP monitored the discussions and posted follow-up questions.

1.2 Participation

The online forum gathered comments from **22 civil society organisations** and **24 different individuals** (see List of participants and organisations in Annex).

Most stakeholders contributing to the online forum represented civil society organisations, namely environmental organisations (n=3), generational organisations (n=4), digital rights organisations (n=5), green digital organisations (n=2), and environmental law organisations (n=3). Several stakeholders represented education and academic entities (n=4). Few of them worked for European think-tanks (n=2) and, lastly, 1 person worked for a mobility organisation.

A total of **60 inputs** were received from stakeholders, with the following distribution: *Access to environmental information* – 6 inputs, *Participation in environmental decision making* – 7 inputs, *Civil society environmental initiatives* – 8 inputs, *Systemic change* – 15 inputs, *Human rights and environmental impacts of ICT manufacturing and life cycle* – 4 inputs, and *Justice/Discrimination in digital environmental technologies* – 7 inputs.

Several stakeholders created new topics of discussion. Some of them were incorporated in the main topics above. Those that did not fit in any of the topics were included in two new sections created by the authors of this report: *EU legislations for digital sustainability* – 5 inputs, and *Digital sufficiency* – 8 inputs.

The inputs submitted by stakeholders are publicly available after registration on the website and can be consulted at the sites indicated below.

Access to environmental information

<https://bit.ly/3BNrkJh>

Participation in environmental decision making	https://bit.ly/3sbjs0V
Civil society environmental initiatives	https://bit.ly/3HePjCv https://bit.ly/3scJEID
Systemic change	https://bit.ly/36BK1nV
Human rights and environmental impacts of ICT manufacturing and life cycle	https://bit.ly/3BIrlhH
Justice/Discrimination in digital environmental technologies	https://bit.ly/3p8KtAi https://bit.ly/3HdeIBK https://bit.ly/3v9H7ki
EU legislations for digital sustainability	https://bit.ly/3LX0dQQ
Digital sufficiency	https://bit.ly/33HY75U https://bit.ly/3v7OHMj https://bit.ly/33OHOEE https://bit.ly/36oZ8Rk

1.3 Online forum questions

The online discussion forum was structured around 6 overarching themes. Each theme had one central question accompanied with an explanatory paragraph.

Theme	Question	Explanatory paragraph
Access to environmental information	Is digitalisation improving access to environmental information?	Access to environmental information is an important environmental right. Digitalisation would seem to be a natural complement to access to information. However, a report by the European Environmental Bureau published in 2019 shows that it is still too difficult to access information on environmental matters across the European Union.
Participation in environmental decision making	Is digitalisation improving participation in environmental decision making for citizens?	Participation in environmental decision making is another fundamental element of environmental rights. The COVID-19 pandemic has forced the issue of public participation in consultation and decision making to the top of the agenda, but it was already the case that digitalisation could offer new opportunities for engagement.
Civil society environmental initiatives	How can digitalisation be directed to help civil society	What is needed to assist or catalyse many different kinds of bottom-up environmental initiatives to succeed using digital tools? For example, citizen science, activist movements, environmental defenders, energy communities,

	environmental initiatives to succeed?	<p>other community-based initiatives? These can serve as important bottom-up initiatives to enhance environmental rights and protection. Are there legal protections or other policies that could support these efforts?</p> <p>How can we think outside the box to enable new actors and a broad conception of democracy to engage successfully using digital tools? How can the legislative and policy environment foster or hinder these initiatives? How can existing institutions support these initiatives? Do we want them to, or does this risk to dilute their bottom-up nature?</p>
Systemic change	How are digitalisation and the need for systemic environmental change related?	We are interested in your views around digitalisation and systemic environmental change. This can take different forms, but we are interested if you have views around the use of digitalisation either to drive a deeper societal transformation, or conversely if it is being used to avoid deeper systemic transformations. What are the implications of this for the environmental rights?
Human rights and environmental impacts of ICT manufacturing and life cycle	How to mitigate human rights and environmental impacts of ICT manufacturing?	Manufacturing and recycling electronic devices (e.g., smartphones, laptops and tablets) come with high human and environmental cost. Smartphones contain rare earths whose extraction have been linked to exploitative operations that use child labour in Africa, and to respiratory diseases among miners (e.g., cobalt miners in Congo digging deep underground without maps or safety equipment and risking asphyxiation or being trapped). Most e-waste is processed in countries like China, India and Ghana, where much recycling is unregulated, releasing toxic chemicals and heavy metals into air and waterways and causing significant harm to workers and their surrounding environment.
Justice/Discrimination in digital environmental technologies	What are the justice implications of digital tools that aim to improve environmental sustainability?	A number of technologies have been proposed as possible tools for sustainability, including Artificial Intelligence, sharing economy apps, smart home technologies, and others. What are the potential environmental justice implications of these technologies? What biases do they potentially introduce? How can these problems be mitigated? Do current EU legislative proposals, such as the AI Regulation, Digital Services Act, or Data Governance Act adequately address the environmental dimension of these technologies?

1.4 Key messages

Below follows some of the main messages presented by stakeholders in the online forum:

- The gap in digital skills was identified as a major barrier in accessing environmental information. Improving citizens' digital skills is thus paramount to fully enjoy the benefits of digitalisation.
- Digital tools do not ensure inclusive participation in environmental decision making. The use of "hybrid" solutions – online and analogue methods – can help to increase access. Governments also need enhanced resources and training to implement such processes.
- Making environmental information more accessible and timelier and bridging the gap in financial capacities and skills in manipulating large datasets of CSO staff were two strong suggestions provided by stakeholders to help civil society environmental initiatives to succeed.
- Digital technology has the potential to drive deeper societal transformations, however its double-edged nature must not be overlooked. Digital tools supporting environmental goals can result in unintended side effects, such as increased emissions, e-waste and human rights abuses.
- Human rights and environmental impacts of ICT manufacturing and disposal have largely remained unaddressed, though extensively documented. Inputs highlighted the importance of adopting legislation setting mandatory human rights and environmental due diligence for corporations across the supply chain of the ICT sector and enhancing circularity.
- Some indicated that the current [EU legislative proposal for Artificial Intelligence](#) (AI) do not sufficiently regulate the social and environmental sustainability of AI, thus further regulation is needed in the AI sector.

2. ONLINE FORUM SUMMARY

The following sections will bring a summary of stakeholders' inputs from the online discussion forum. The summary is categorized in 6 sections to reflect the structure of the online forum. Additionally, 7 new topics of discussion were created by stakeholders. Some of them were integrated in the main topics. Those that were not relevant to the 6 overarching topics were included in two new sections created by the authors of this report – "EU legislations for digital sustainability" and "Digital sufficiency".

Policy suggestions are not meant to represent a consensus or recommendation on the part of the forum but are rather concrete policy proposals or ideas that emerged during the discussion that should be considered in the context of enhancing environmental justice in the context of digitalisation.

2.1 Access to environmental information

A total of 6 submissions were received for the discussion "Is digitalisation improving access to environmental information?". All inputs can be accessed here: <https://bit.ly/3BNrkJh>

Respondents agreed that digitalisation undoubtedly improves access to environmental information. However, the gap in the public's digital skills was identified as a key issue that hinders access to information to the broader population, and the importance of properly resourcing government authorities to provide the information as well due to frequent failures at many levels of government to respect legal deadlines for access to information. It remains important to provide basic environmental information, and avenues to request it, through non-digital means to ensure broadest possible access.

Policy suggestions

- Improve public's digital skills and IT literacy to take full advantage of opportunities offered
- Improve public administration's resources and training in providing information digitally
- Environmental information should continue to be available offline and using traditional tools
- Make more publicly available data and information machine readable to ease access
- Data needs to be more proactively published within a reasonable time frame across all EU Member States

First, **Csaba Kiss, Coordinator at Justice & Environment**, a network of 14 green law NGOs based in several EU countries, highlighted the need to improve the digital skills of the members of the public in order to fully enjoy the benefits of digitalisation.

Secondly, **Alba Iranzo Dosdad, Environmental Lawyer at the International Institute for Law and Environment**, indicated that breaches of the Aarhus Convention obligations by public authorities are still common, thus “technological advances are not necessarily linked to better implementation of this environmental right”. Her recommendation is not only to improve the digital skills of the society, but also to “strengthen the resources (human and technical) and knowledge of public administrations on this matter”.

Furthermore, **Stefan Sika, Policy Analyst at the European Policy Centre**, a Brussels-based think tank on European Union affairs, expressed that environmental information should not be solely available online, but also offline (e.g., newspapers, notes in public spaces, etc.).

Lastly, **Laura O’Brien, UN Advocacy Officer at Access Now**, highlighted the lack of internet access, which disproportionately affects people in marginalized communities, such as women and girls, people in racial and ethnic minority groups, rural and indigenous populations, and people with disabilities. Open, affordable, and universal internet connectivity is a means to enable the realization of other rights. It ensures individuals can communicate and document the environmental impacts on their communities and access the information they need.

Stakeholders cited interesting examples of public and private initiatives aiming at bridging the digital gap (see Boxes 1 and 2 below), but it is not clear how successful these are.

Box 1: The Digitális Jólét Program, a public initiative

The Digitális Jólét Program (DJP), Digital Success Programme in English, is an initiative launched by the Hungarian Government in 2015 to allow every Hungarian citizen and business to benefit from digitalisation. Developing the digital competencies of citizens is a strategic goal of the Digital Success Programme. Citizens will be provided access to the digital world and the free acquisition of basic digital competencies. More information about the Digital Success Programme [here](#) and the Digital Knowledge Development [here](#).

Box 2: The Orange Digital Centre, a private initiative

The [Orange Digital Centre](#) is an initiative organised by Orange Group with digital equity as its core objective. Orange Digital Centres are educational centres dedicated to developing citizens' digital skills. A wide range of courses are offered, such as coding courses, digital production workshops for creating with digital equipment (e.g., 3D printers). These trainings are particularly aimed at students, young graduates, and young entrepreneurs. By 2025, a Digital Centre will be found in every country where Orange operates.

Figure 1: Word cloud for inputs on access to environmental information



2.2 Participation in environmental decision making

A total of 7 submissions were received for the discussion “Is digitalisation improving participation in environmental decision making for citizens?”. All inputs can be accessed here: <https://bit.ly/3sbjs0V>

The majority of stakeholders agreed that digitalisation offers opportunities to improve participation in environmental decision making. However, it was pointed out that digital tools do not guarantee equal access to participation in environmental decision making, and that significant care is needed to avoid that consultation is only available in online formats. Offline formats may be better suited in some cases. In addition, the technical and managerial skills to run effective online consultations need to be well developed within governments.

Policy suggestions

- Use hybrid solutions, digital and non-digital means, to maximise access
- Public education to develop public’s e-literacy and digital skills
- Improve public internet access
- Provide direct feedback to participants after their engagement
- Ensure the involvement of different age groups in consultations, including young and old

On the one hand, **Max Westbrook, Project Manager at Liquid Democracy**, a non-governmental organisation based in Germany specialised in digital democracy, emphasized that “digital participation tools and platforms offer possibilities to invite more interested people than analogue methods would reach”. Additionally, digital participation tools can help to structure processes effectively and ensure transparency. This respondent also shared a successful example of e-democratic public participation in environmental matters (see Box 3 below).

Stefan Sipka, Policy Analyst at the European Policy Centre, also highlighted the potential of digital participation by giving a few examples related to the Aarhus Convention. According to him, online meetings could become more prominent in public participation procedures under the Aarhus Convention. Additionally, access to relevant documents by the public could become easier by providing information in a digital format.

Bringing the youth perspective into the discussion, **Charlotte Unruh, Fellow at Network Future Justice**, agreed that digital technologies can offer opportunities for increasing participation among youth, given young people’s tendency to

avoid “traditional” ways of political engagement. Indeed, digital tools offer chances such as communication and debate across physical distance, large-scale collaboration, and crowdsourcing for creative solutions.

On the other hand, **Csaba Kiss, Coordinator at Justice & Environment**, reported that digital illiterates do not have equal access to environmental decision making, meaning that these people are to some extent deprived of their rights. He therefore recommended to use hybrid solutions or to invest into raising awareness and developing the skills of the digital illiterates.

Similarly, **Alba Iranzo Dosdad, Environmental Lawyer at the International Institute for Law and Environment**, also agreed on the need to address the digital divide. She urged to strongly develop and improve citizens’ e-skills and accessibility to resources, ensure that e-tools/platforms are user-friendly and offer translation services when needed, and make significant investments to improve infrastructure in rural or remote areas. Moreover, the lack of feedback provided to citizens on their contributions was another issue pointed out by this respondent. She indicated that more transparency on what has been done with citizens’ input and how they influenced environmental decision making would increase the effectiveness of digital public consultations.

Figure 2: Word cloud for inputs on participation in environmental decision making



According to **Muki Haklay, Professor of Geographic Information Science in the Department of Geography at University College London (UCL)**, this topic is complex, as it depends on the purpose, context, and most crucially, who we are talking about. First, online spaces are not suitable for the development of empathy, trust, and relationships, which are crucial for human interactions and discussions. It is easier to discuss complex issues in offline settings. Also, the level of participation in environmental decision making depends on the tools used and their quality, the careful design and management of the process. These require specific skills and knowledge that are not uniformly shared within public organisations. Finally, the cost of access to the network (i.e., poor people might not have data packages from network operators that allow unlimited access), the access to devices that are suitable for participation (e.g., large screen) and the age of the equipment were identified as significant challenges in ensuring equal participation in environmental decision making. All in all, “it is not appropriate to think about technology as only improving or only hindering a process – it’s doing both, to different people”. Professor Haklay recommended to carefully study advantages and disadvantages in order to provide guidelines and best practices in different contexts.

Charlotte Unruh, Fellow at Network Future Justice, outlined earlier the opportunities that digital tools can offer to foster participation of young people in environmental decision making. Nevertheless, she also elaborated on the fact that digital tools can present several risks such as surveillance, polarisation, adverse effects on users’ mental health, etc. Moreover, where young people do not use analogue participation methods, this might be due not to preference but life circumstances (such as unstable jobs). Overall, digital options are useful for fostering participation of young people when they are used to improve the reach of real-world participation methods (not replace them!), enable transparent access to information, and ensure privacy and data protection.

Finally, a remark was made related to the scarce of participation of civil society in deciding if a technology should exist at all. **Anna Berti Suman, a post-doctoral fellow at the European Commission Joint Research Centre**, explained that often Silicon Valley corporations have the “monopoly” over technological and digital developments. This has resulted in the emergence of the [Non-Aligned Technologies Movement](#) (NATM), a movement advocating for decentralised and people-centred technologies, where civil society would have a say in decisions regarding the development and use of technologies. In essence, NATM would offer alternatives to Big Tech, based on the principles of (digital, environmental, and social) justice and equity.

Box 3: Citizens' Assembly on Climate

The Citizens' Assembly on Climate is a project that calls for democratic and participatory public involvement in shaping the future of Germany. Between April 26 and June 23, 2021, the Citizens' Assembly digitally gathered 160 randomly selected citizens, from all over Germany, to discuss how Germany can meet its climate protection targets. More precisely, the topic of discussion was the following: "How can Germany achieve the goals of the Paris Climate Agreement - considering social, economic and ecological perspectives?". Participants met online to discuss the issue, listen to presentations, and develop recommendations. All recommendations are collected in a Citizens' Report, which is passed on to politicians. Further details on the project can be found [here](#).

2.3 Civil society environmental initiatives

A total of 7 submissions were received for the discussion “How can digitalisation be directed to help civil society environmental initiatives to succeed?”. All inputs can be accessed here: <https://bit.ly/3HePjCv>. In addition, the [discussion](#) entitled “How can citizen-collected evidence be used in courts for supporting environmental justice claims?” was included in this section given its relevance to the topic.

Policy suggestions

To help civil society environmental initiatives to succeed, contributors to the online forum expressed the need to 1) make environmental information more accessible (see section 1 on environmental information), 2) bridge the gap in financial capacities and skills in manipulating large datasets, and 3) run social media campaigns in parallel with ongoing projects.

To begin, for **Frederik Hafen, Environmental Democracy Officer at the European Environmental Bureau**, access to information is the “starting point” in activism. Public data on environmental issues need to be made more accessible, proactively published and machine readable to allow environmental activists to succeed in their initiatives. As a baseline this is often not the case at the moment.

Similarly, **Muki Haklay, Professor of Geographic Information Science in the Department of Geography at University College London (UCL)**, also identified online access to environmental information as a key component in helping civil society organisations. Emphasis was also given to the proliferation of citizen sensing and citizen science which provide an opportunity for bottom-up data collection. To illustrate his point, this respondent shared some good practices. One of them is a bottom-up initiative utilising and analysing environmental data called [Open Environmental Data Project](#), the other one is a citizen science project (see Box 4). However, the gap in financial resources and skills in collecting and manipulating large datasets was a significant issue noted by Professor Haklay. Due to high costs associated with the manipulation of large datasets, civil society are at a clear disadvantage, while big actors, namely governments and corporate players, have the resources and capacities to use these to their advantage. Luckily, there are some initiatives providing opportunities for staff from civil society organisation to improve their data skills (see Box 5).

Box 5: Sensing for Justice

The project SensJus aims at researching the potential of civic monitoring of environmental issues as a source of evidence for environmental litigation and as a tool to foster environmental mediation. For more information on the project, see the project's webpage <https://sensingforjustice.webnode.it>.

Box 6: CorrelAid

The mission of CorrelAid is to democratise data science by educating employees of the social sector. Around 1900 data scientists volunteers are supporting civil society organisations by offering educational programmes to improve data literacy of civil society. Read more about this initiative [here](#).

On the other hand, **Csaba Kiss, Coordinator at Justice & Environment**, thought that Mr Haklay's stance was rather pessimistic when explaining the contrast between the financial capacities of corporate players vs civil society organisations. In his opinion, if we remove companies from the equation and focus on the State – citizen relationship, "we still have citizens with rights (human, procedural), then we have the State and state bodies with obligations (constitutional, legal) and in this context, digitalisation means rights more easily exercised and obligations more cheaply fulfilled".

In the same vein, Mr Kiss explained that digitalisation can help civil society initiatives receive funding as today plenty of crowdfunding platforms are easily accessible, such as www.gofundme.com. Yet, media coverage of these platforms should be increased. Alternatively, he recommended to create a crowdfunding platform specifically for environmental rights-based initiatives. Moreover, Mr Kiss underlined the importance of running online campaigns (on Facebook or Instagram) in parallel with ongoing legal actions. This could inform society of a case regarding, for example, the protection of a habitat, and eventually "members of the public see the values of nature to be saved and can exercise pressure on decision-makers to move towards sustainability".

To complement the contribution of Mr Kiss, **Marie-Kathrin Siemer, Project Manager at Liquid Democracy**, highlighted the political sphere as another major area where digitalisation can support the work of civil society. By running online participation platforms, members of the public can be consulted to share their expertise and, consequently, influence decision making.

Finally, **Dr Jürgen Focke, Policy and Advocacy Officer at HelpAge Deutschland**, brought the elderly perspective into the discussion by explaining that vulnerable groups, such as the elderly and people with disabilities, struggle living in a digital world. Indeed, digitalisation influences almost all areas of life, yet age, gender and ethnicity issues are usually not taken into account. The studies conducted by HelpAge show that older people are open to digital media in general but desire to avoid using them because they sometimes find them difficult to use. For example, modern washing machines and dishwashers function almost exclusively via settings activated by LED display - those with visual impairment will not be able to use such machines. Another study conducted by HelpAge in Japan and Taiwan in 2018 on the introduction of robot-assisted vending machines showed that while the Japanese seniors were open to the care robots, they were rejected in Taiwan because of their preference for care by nursing staff. All in all, different interests and views will emerge across generations, and this divergence of views should be respected, even the wish to live without digital media and autonomous technical systems. Moreover, this expert stated that digital developments can help elderly people to carry out activities in their daily life, but recommended efforts to sensitise society and political leaders on this matter, “because often the topic of digitalisation is only condensed to the sector: internet capability”.

In a new topic of discussion, **Anna Berti Suman, a post-doctoral fellow at the European Commission Joint Research Centre**, explored citizen-collected evidence and their use in environmental litigation. She shared the case of the [Formosa ruling](#), where a petrochemical company was found liable for violating the United States Clean Water Act. This court decision was issued in Texas in June 2019. She further explained that “the case – initiated by a civic group – was mostly built on citizen-collected evidence involving volunteer observations of plastic pellets, powder and flakes in the water over a considerable time span”. This expert expressed that this case could inspire and teach other citizen-run monitoring initiatives in exploring the court arena, and wrote [a report](#) on the lessons that can be learned from the Formosa case. Furthermore, she reflected on the conditions needed to allow a similar case to happen in other parts of the world, especially in Europe, “where the discussion is still in its infancy, and it is mostly focused on the use of such evidence for policy”. (The legitimization strategies that lay people use to have the evidence they collect heard by (policy and judicial) institutions can be

discovered in [this paper](#).) Thereupon, the project Sensing for Justice ([SensJus](#)) investigates "the potential of introducing Citizen Sensing as a source of evidence in litigation". Dr Berti Suman is the principal researcher of the project SensJus.

Figure 3: Word cloud for inputs on civil society environmental initiatives



2.4 Systemic change

A total of 15 submissions were received for the discussion “How are digitalisation and the need for systemic environmental change related?”. All inputs can be accessed here: <https://bit.ly/36BK1nV>

Numerous participants agreed on the potential of digital technology as an enabler for the green transition. However, several inputs highlighted that technology’s potential is double-edged due to unintended rebound effects, such as increased emissions and e-waste resulting from increased usage of ICTs. These externalities have potentially significant implications for environmental justice, as they shift the burdens between geographies and populations. Therefore, some stakeholders indicated the importance to tackle digital and environmental challenges jointly and using participatory governance models, and possibly looking at more active regulation and limits on the uses and deployment of digital technologies.

Policy suggestions

- Increase democratic and societal surveillance and control of digital technologies
- Link environmental and digital challenges to a greater extent in government policy
- Switch to open-source technology to a greater extent than today
- Switch to a more holistic view of well-being and economic growth
- Change public procurement rules around digital technologies to acknowledge sustainability and environmental challenges more

First, **Muki Haklay, Professor of Geographic Information Science in the Department of Geography at University College London (UCL)**, reflected on the fact that there is a fundamental problem which is the disconnect between the idealised version of the Web, suggested in the 1990s, as an open and civilised arena and today’s reality. In addition to that, actors of the ICT sector tend to paint an environmentally friendly picture of the sector, which is also a fallacy. This respondent called on actors in the ICT sector to dramatically slow down update cycles and work instead on the quality of software, integrate a full life cycle approach to all equipment, and reduce Waste from Electrical and Electronic Equipment (WEEE) to a minimum. However, today no ICT company is adopting this approach. According to Professor Haklay, “we don’t pay enough attention to the damages from digitalisation and tend not to notice the environmental impacts”, thus he recommended efforts to “reconsider what are the aspects of digitalisation that are compatible, in the long term, with environmental goals, and make

technology subordinate to the environmental and societal needs instead of letting it run without democratic and societal control”.

Charlotte Unruh, Fellow at Network Future Justice, agreed with Professor Haklay’s comment on strengthening democratic control in the governance of digital technology. In a separate post, she expressed her concerns regarding the ripple effects of digital tools supporting environmental goals. For example, “if digital tools reduce the energy needed to produce a certain good, and much more is produced as a result, then the net result for the environment could be negative”. Therefore, she stated that “digital and environmental challenges need to interact and be tackled together”, instead of focusing solely on the development of digital tools which could result in unintended side effects on the environment. In a nutshell, this respondent emphasised that digital technology can indeed offer new opportunities, albeit double-edged ones. Thus, she recommended to ensure that “future generations are always in charge of technology”, meaning that democratic control over digital tools remains safeguarded in the future. AI development should be open and transparent, and the introduction of new technologies should be discussed publicly, to prevent path dependencies or unintended effects that might limit future generations’ democratic control over digital tools.

Similarly, **Stefan Sipka, Policy Analyst at the European Policy Centre**, discussed the benefits (e.g., better transfer of sustainability-related information across value chains, enhanced research, industrial and waste management processes via AI, robotics and 3D printing, etc.) and the negative side effects (e.g., increased emissions and e-waste resulting from usage of ICT) of digitalisation. This expert reinforced the importance to tackle digital transition and environmental transition hand in hand.

Conversely, **Scott Marcus, Senior Fellow at Bruegel**, a European think-tank specialised in economics based in Brussels, noted that “the formulation of the explanatory paragraph puts a needlessly negative spin on the relationship between digitalisation and sustainability”. He acknowledged the double-edged dimension of technology, nevertheless “the positive potential of digitalisation is tremendous” according to this expert. In a separate post, this respondent elaborated on the crucial role of digitalisation in advancing sustainability in Europe. Agriculture (production and distribution), transportation (coupled with a shift away of private vehicles and increased telecommuting) as well as energy and heating systems in homes were key sectors identified by this respondent where digitalisation can help greening. In addition, Mr Marcus included in his recommendations the need to green the ICT sector itself, coupled with greater use of renewable energy (e.g., for data centres). Most notably, Mr Marcus explained how he envisions the modernisation and digitalisation of the transport sector. Public transportation (subway

and bus for day-to-day transport within the city and renting on rare occasions when travel outside is needed) and collaborative economy solutions (e.g., ride-sharing services such as BlaBlaCar) were identified as two cost-effective alternatives to private cars.

Figure 4: Word cloud for inputs on systemic change



Yet, with the expansion of the vehicle automation sector, research shows that the distance travelled is likely to increase due to the drop in the price of a ride. “In such a scenario, what incentive will there be to share a ride or to take high-capacity transport modes?”, wrote **Suzanne Hoadley, Senior Manager and Traffic Efficiency Coordinator at POLIS**, a network of European cities and regions cooperating for innovative transport solutions. On the other hand, this expert explained various ways digitalisation can help increase accessibility of public transportation, although physical accessibility of public transport for vulnerable people, namely people with disabilities, is still not fully guaranteed.

Furthermore, **Marie-Kathrin Siemer, Project Manager at Liquid Democracy**, explained that digitalisation plays a major role in driving a systemic environmental change. However, this systemic change must take place in a democratic way, where people are heard and seen. Hence, there is a need for digital participation, for an alternative that is more accessible, easier to use, and more transparent. This respondent shared a digital democracy project run by her organisation (see Box 6). Although digital participation requires literacy and capability of its users, it is

important to ensure that participation software/digital tools are easily comprehensive and intuitive. When this aspect is implemented, then “digital participation is a lot more accessible than current offline participation processes that are bound to time and space”, which can exclude people working, with care work, with disabilities, etc. To ensure online participation tools do not exclude anyone, Ms Siemer recommended to use a multi-level approach (i.e., online, offline, workshops, information events, etc.). On top of that, this expert highlighted the importance of using Open Source Software, which is more sustainable, more resistant to security issues, and is not bound to a specific organisation or company.

Box 6: Adhocracy+, a digital democracy project

Adhocracy+ is an open-source participation platform developed and operated by Liquid Democracy. It is currently used by many municipalities, universities, political parties, and civil society organisations. With adhocracy+, digital participation projects can start directly, without installation or prior technical knowledge. Find more information [here](#).

However, **Dursun Bas, Project Coordinator at the Istanbul Policy Centre at the Sabanci University**, explained that divergent stakes/interests hinder the ability of digitalisation to lead systemic transformations. For instance, the current fabric of the global system (i.e., trade and power relations) and its distributional impacts still dominate national level actions. On the local level, companies, and public institutions in charge of urban services (i.e., gas, electricity, water, energy-heating, and internet) are profit-driven and limited amount of money collected by these companies is used in the public interest. This is problematic, thus Mr Bas recommended to redefine public procurement rules. On top of that, due to low purchasing power of middle-income groups, systemic change is not likely to happen in their daily lives. Thus, this respondent reflected on the need for a mindset change in our socio-economical patterns (i.e., affordable housing, health, energy and transport), to better enable the benefits of digitalisation in driving systemic transformations. The consumer rights organisations are also important partners to watch the ongoing digitalisation of consumer data and its use.

2.5 Human rights and environmental impacts of ICT manufacturing and life cycle

A total of 4 submissions were received for the discussion “How to mitigate human rights and environmental impacts of ICT manufacturing and life cycle?”. All inputs can be accessed here: <https://bit.ly/3BlrlhH>

Contributors highlighted that the human rights and environmental impacts of ICT manufacturing are broadly known, yet these impacts remain largely unaddressed despite legal instruments designed to address these problems. These problems are “exported” to jurisdictions with weaker environmental, human rights, and labour standards and enforcement, often to the detriment of children, women, and other vulnerable groups. Some stakeholders called on EU policymakers to adopt legislation setting mandatory human rights and environmental due diligence for corporations across the supply chain of the ICT sector, as well as improving the circularity of the sector through initiatives such as the right to repair, eco-design and stricter and more expansive eco-labelling.

Policy suggestions

- Ensure new EU corporate due diligence legislation includes binding human rights and environmental standards for companies
- Include human rights qualification in all business degrees
- Slow down consumption of ICT
- Boost R&I for innovation using existing hardware
- Robust “Right to Repair” to ensure digital goods are reusable and repairable
- Robust Eco-design requirements to ensure that ICT products are durable and energy-efficient
- Transparent energy labelling to oblige manufacturers to disclose information concerning the energy consumption of products placed on the EU market

First, **Csaba Kiss, Coordinator at Justice & Environment**, expressed his concerns regarding the human rights and environmental impacts of ICT manufacturing, which are problems looming behind the entire global digital development. Regulation of mining companies was highlighted as an important measure by this contributor. Whilst **Muki Haklay, Professor of Geographic Information Science in the Department of Geography at University College London (UCL)**, indicated that the most important measure is to slow down consumption of ICT. As a matter of fact, the ICT sector has been developing without considering issues

of longevity, reparability and avoiding obsolescence. On this matter, Professor Haklay recommended participants of the e-forum to read [this article](#). In addition to that, this expert proposed to boost research and innovation in demonstrating innovation with existing (and not novel) hardware. To illustrate the human rights and environmental harms of ICTs, Professor Haklay shared [the EJOLT map and project](#).

Secondly, **Claudia Dias Soares, Professor of law at the Portuguese Catholic University**, explained that, according to the Basel Convention, exporting hazardous substances to developing countries is illegal. Yet this practice, linked to waste from electrical and electronic equipment, and despite the WEEE Directive, is still [widespread in the EU](#). Despite this, and the provisions of other conventions such as Minamata and Stockholm Convention on Persistent Organic Pollutants, polluting and hazardous manufacturing processes operated in developing countries directly or indirectly by companies from developed countries lead to the breach of human rights and environmental standards. This leakage contradicts the concept of circular economy adopted in EU environmental policy and damages EU ambitions to play a leadership role in the field of human rights and the environment.

The health and environmental impacts from ICT manufacturing and recycling are broadly known and well-documented. But due to lack of transparency and complex web of interlocking supply chains, these impacts remain unaddressed and are still ongoing due to a lack of legal protections or poor enforcement. Workers are particularly impacted, and since these workers are [mainly female](#) and hazardous chemicals affect female and male workers differently (for example, antenatal health impacts deserve special attention while assessing the impacts of manufacturing and recycling electronic devices in a context of a whole society), human rights due diligence (HRDD) must be gender sensitive.

Thus, the current soft law-based approach does not seem to be effective in preventing the export of environmental externalities and human rights abuses. Therefore, this respondent called on companies to undertake robust human rights due diligence through global supply and value chains in-line with United Nations [Guiding Principles on Business and Human Rights \(UNGPs\)](#). In addition, at the EU level, she proposed to address this problem by adopting legislation setting mandatory (HRDD) and full disclosure regarding which safety precautions have been taken along the entire supply and value chains of ICT products and components entering the EU market, as is already the case in some Member States, such as the duty of vigilance law in France. Similarly, Germany is in the process of implementing the ["Act on Corporate Due Diligence in Supply Chains"](#) that will enter into force in 2023. Professor Soares explained that implementing such measures would represent "a paradigm shift by moving away from purely

voluntary corporate social responsibility to binding human rights and environmental obligations for companies". However, she cautioned that the adoption of an EU Directive should not lead to downgrading the current levels of national legal protection. On top of that, she advised that qualification in human rights should be mandatory in business management degrees.

Figure 5: Word cloud for inputs on human rights and environmental impacts of ICT manufacturing and life cycle



Furthermore, **Ljuba Ferrario and Sophia Merkel, co-leads of the Digitalisation Project Team within the Circular Economy Working Group at Generation Climate Europe (GCE)**, a climate coalition of youth-led networks at the EU level advocating for ambitious policies on climate and environmental issues, acknowledged the role of digitalisation as a powerful tool for the ecological transition, but registered their concerns concerning the growing carbon footprint of ICT. The two young activists suggested policy interventions at three levels: regulators, producers and consumers.

On the regulators and producers level, they proposed to incorporate ecological standards into regulation: 1) "Right to Repair" to ensure digital goods are reusable and repairable, 2) Eco-design requirements to ensure that products are durable and energy-efficient, and 3) Energy labelling to oblige manufacturers to disclose information concerning the energy consumption of products placed on the EU market. Moreover, the two young activists urged the European Commission to

put forward a robust proposal on due diligence in order to mitigate the environmental and human rights impacts across the supply chains of the ICT sector.

On the consumers level, consumers can play a key role in making the ICT sector more sustainable by making informed choices, thus “the display of clear information on the environmental and social impact of ICT products must be mandatory for companies”. Notably, Ms Ferrario and Ms Merkel advocated for the involvement of young consumers in decision-making processes to bring about the required changes “as we are the primary users but also those who will have to bear the consequences of an unsustainable ICT sector”.

2.6 Justice/Discrimination in digital environmental technologies

A total of 5 submissions were received for the discussion “What are the justice/discrimination implications of digital tools that aim to improve environmental sustainability?”. All inputs can be accessed here: <https://bit.ly/3p8KtAi>. In addition, the [discussion](#) entitled “Can we quantify the environmental impact of surveillance capitalism?” was included in this section given its relevance to the topic as well as the [discussion](#) “EU action for data frugality”.

Stakeholders contributing to this discussion discussed the potential environmental justice implications of AI, the digital platforms sector as well as smart home technologies. Some indicated that the current EU legislative proposals - AI Regulation, Digital Services Act, or Data Governance Act – do not sufficiently regulate the social and environmental justice impact of these technologies, thus further sectoral regulation is needed. The privacy implications, as well as the economic imbalance and energy use of targeted advertising and data gathering were highlighted.

Policy suggestions

- Additional regulation needed in the AI sector: 1) on AI-related Resource Consumption and Transparency Requirements, 2) on Unfair Competition and Data Governance/Data Access, 3) on Workers’ rights in relation to AI, and 4) on promoting sustainable consumption and AI development.
- Regulations of digital policy needs to provide meaningful access to justice provisions
- Online service platforms need to be closely supervised due to their important role in the digital economy and likely negative impacts for broader society while providing profitable revenue streams for small groups
- Build more sustainable alternatives to the big private platforms as public infrastructure instead of depending on GAFAM (Google, Amazon, Facebook, Apple, and Microsoft)
- Prohibit trade in personal data, personalised advertisements, live facial recognition cameras, and untargeted interception of telecommunications
- Update EU-Aarhus related legislation to better integrate digital solutions

Charlotte Unruh, Fellow at Network Future Justice, started the conversation by outlining some potential environmental justice challenges of digital tools, such as 1) Loss of autonomy of users and consumers, 2) Unequal access to technology, 3) Risks of unintended harms, 4) Technologies might not be fit for all social and cultural contexts, 5) The tech company landscape populated by relatively big and

few tech companies, which can result to problems such as dependence, lack of competition and power asymmetries.

At the EU level, **Stefan Sipka, Policy Analyst at the European Policy Centre**, indicated that EU policy makers are yet to fully establish the link between digitalisation, green transition and justice. However, court and enforcement agencies can use Earth observation to determine if there is a breach of EU's acquis on certain sites (e.g., illegal construction projects and landfills) already today. Moreover, the Commission's work on common data spaces and the ongoing work on the [Data Governance Act](#) were identified as key components in helping judges, prosecutors and inspectors to access more information and consequently take further actions against infringements of environmental law.

This stakeholder also mentioned the role of AI in supporting data collection and better decision making, although clear AI ethical standards must be defined to avoid bad decision making, namely discrimination against certain categories of people. On top of that, Mr Sipka noted that access to information, public participation and access to justice in environmental matters could be improved if EU's Aarhus-related legislation (i.e., [Environmental Impact Assessment Directive](#), [Strategic Environmental Assessment Directive](#), [Industrial Emissions Directive](#) and [Habitats Directive](#)) and digital solutions were interlinked.

On the other hand, it was pointed out by **Anne Mollen, Policy & Advocacy Manager at AlgorithmWatch**, that current legislative proposals on the EU level are considering AI (and digitalisation in general to some extent) in regard to their environmental impact. The point at issue here is that making AI systems CO₂-friendly will not make them sustainable in an economic or social dimension, thus "we argue to equally consider their social and economic sustainability – and especially their interdependence". Thereupon, the project [SustAin](#) organised by AlgorithmWatch identified over 50 indicators to measure the sustainability of AI in a social, economic, and ecological dimension. The upshot is that further sectoral regulation in relation to AI is needed. Ms Mollen cited several examples of additional regulation needed in the AI sector: 1) on AI-related Resource Consumption and Transparency Requirements, 2) on Unfair Competition and Data Governance/Data Access, 3) on Workers' rights in relation to AI, and 4) on promoting sustainable consumption and AI development.

Emphasis was given to the digital platforms sector by **Suzanne Hoadley, Senior Manager and Traffic Efficiency Coordinator at POLIS**, which is particularly susceptible to negative impacts and thus require policy interventions in many cases. The cases of eCommerce and Mobility as a Service (MaaS) were identified by this respondent. Initially a solution to reduce the need for people to travel to buy goods, eCommerce is today causing a rise in traffic and km travelled in cities. "It's

encouraging customers to buy far more than they need because returning items is easy and mostly free, thereby leading to a higher carbon footprint”, explained Ms Hoadley. MaaS, on the other hand, is a new digital platform that can digitally integrate all transport services in a single app and can be tailored to the specific transport needs of a user. The aim of this digital platform is to encourage users to avoid using the personal and opt for more sustainable transport modes. However, this expert registered her concern that “third party MaaS providers could discourage sustainable mobility due to the business model whereby a MaaS provider’s revenue stream depends on commission from the sale of trips”.

Figure 6: Word cloud for inputs on justice/discrimination in digital environmental technologies



Finally, **Chris Adams, Director at The Green Web Foundation**, pointed out that “one of the key biases many of these tools named introduce is that in many cases the business models revolve around obscuring lots of the governance structures, or who is responsible for decisions being made”. Thus, according to Mr Adams, the above-mentioned EU legislative proposals need to provide meaningful access to justice to groups being marginalised.

Regarding sharing economy apps, this expert explained that “there is an assumption that they are competing with individual ownership of assets, and achieving sustainability gains through more efficient, or intensive use of the same assets...

[however] there's an incentive to displace other activity that is less polluting, but also less likely to help make a return for investors".

This provides an incentive for those benefiting economically from the service to lobby governments to protect these new revenue streams, entrenching their economic power, while those who are disadvantaged either economically or environmentally will be more dispersed and find it much harder to lobby on their own behalf. This is clearly the case for home or mobility sharing apps. He recommended to look between different economic sectors to see how this type of dynamic of imbalance of power can be addressed. To support his point, this respondent shared a case study from the United States (see Box 7 below).

Box 7: The Intervenor compensation

One interesting example from the United States is the [Intervenor compensation](#) in the energy sector, used to help marginalised groups access justice by making it easier for them to make use of existing laws or exercise existing rights, and the cost is built in as part of the rates built into the bills paid by users.

In a new topic of discussion, **Konstantin Macher, Campaigner at Digital Courage**, a German NGO advocating for fundamental rights, privacy and protecting personal data, reflected on the environmental impact of surveillance capitalism. To read the definition of the term coined by the academic Shoshana Zuboff, this respondent encouraged to have a look at [this webpage](#). First and foremost, we must turn to online advertisements and the way they work nowadays: "Instead of context-related advertisement (e.g., on a tech-related website you get advertisements about new tech products), nowadays the ad-economy is dominated by personalised advertisements", meaning that users are profiled by recording and analyzing their online behavior.

The point at issue here is what kind of energy consumption does surveillance capitalism generate. [This study](#) shows that online advertisement in 2016 generated 60 Mt CO₂, which equates to Ireland's emissions in 2019 and 10% of overall internet traffic. Mr Macher recommended efforts to collect more empirical data on this matter to fill the knowledge gap on how big the environmental impact is. Consequently, "more transparency could foster a democratic discourse on whether we really want this form of surveillance capitalism". To tackle this issue, this respondent highlighted one important measure to develop: build more sustainable alternatives to the big private platforms as public infrastructure instead,

for example the [Open Web Index](#), “which could be the basis for an innovative internet economy that is open to small and medium business, instead of depending on GAFAM (Google, Amazon, Facebook, Apple, Microsoft)”. [This report](#) by the German Advisory Council on Global Change further elaborates on this topic.

Finally, in a new topic of discussion entitled “EU actions for data frugality”, **Meadhbh Bolger, Resource Justice Campaigner at Friends of the Earth Europe**, asked stakeholders if the EU should/can prohibit trade in personal data, personalised advertisements, live facial recognition cameras, and untargeted interception of telecommunications as a way to significantly reduce the storage, transmission, and processing of personal data. According to this expert, “this could not only temper data growth but also protect us from consumerist manipulation, political microtargeting, and mass surveillance”. She further explained that “a more frugal use of data might actually improve our quality of life while at the same time preserving resources for our descendants”.

2.7 User suggested topics

2.7.1 EU legislations for digital sustainability

The topic of discussion “Which EU legislation - Digital Services Act, the Digital Market Act, and the Artificial Intelligence Act - are most relevant for digital sustainability?” is new and was launched by **Mute Schimpf, Food Campaigner at Friends of the Earth Europe**. The topic did not fit in any of the thematic sections above, a new section was thus created in this report. A total of 5 submissions were received for this discussion. All inputs can be accessed here: <https://bit.ly/3LX0dQQ>

Commenters agreed that the most recent legislative efforts at EU level to introduce legislation to regulate the sustainability of digital tools have missed opportunities to effectively regulate digitalisation. For example, previous reporting requirements on environmental risks of algorithms and business practices have been dropped from the Digital Services Act (DSA), and there are no requirements regarding product standards on online platforms.

To kick off the discussion, the moderator of the e-forum, **Krisztina Korpassy, Policy Assistant at the Institute for European Environmental Policy**, demonstrated that the development of AI policies is the most important initiative, and more specifically the [2021 Coordinated Plan on Artificial Intelligence Review](#). Although the AI Regulation will help to support digital sustainability, in its current format it is simply setting up a strict legal environment where AI initiatives can be safely developed, tested and put into service. Contrariwise, the Review is demonstrating in concrete terms how the EU is planning to use AI to support its climate goals (see Chapter 11 Bring AI into play for climate and environment from pages 37 to 40) via a variety of actions such as boosting research and innovation in AI for sustainable production. In essence, the Review states that AI solutions are considered as “indispensable if the EU is to achieve its objectives in terms of climate neutrality, overall lower consumption of resources, greater efficiency and a more sustainable EU in line with the United Nations’ 2030 Agenda and sustainable development goals (SDGs)”.

Stefan Sipka, Policy Analyst at the European Policy Centre, agreed with the previous comment concerning the significant role of the AI legislation in supporting the green transition (e.g., using AI in green public procurement, researching more circular materials, law enforcement, enhanced waste management). He added that we must bear in mind the negative side-effects of AI (i.e., emissions) and ensure that they are minimised. Developing ethical AI in social but also in environmental and climate terms was a strong suggestion provided by this stakeholder.

Besides, this expert highlighted the potential of the [Digital Services Act](#) to help address the environmental impacts of e-commerce, though in its current form it does not make strong requirements on online marketplace operators to, for example, control if products sold via these platforms are compliant with EU's eco-design or Extended Producer Responsibility (EPR) requirements. According to this expert, "the online marketplace operators could also be required to promote eco-friendly products and counter green washing as suggested by the European Parliament". In a nutshell, Mr Sipka demonstrated that the DSA has also an important role, however he recommended to improve its link to the green agenda.

On the other hand, **Anne Mollen, Policy & Advocacy Manager at AlgorithmWatch**, agreed with Mr Sipka's point on the relevance of the DSA. However, she explained that opportunities are slipping away given the positions reached by the European Parliament towards the end of January. Although, in some previous versions, large online platforms would have needed to report on environmental risks posed by their algorithms and their business model, unfortunately environmental risks have not been included in the final draft of the European Parliament.

Furthermore, this stakeholder reinforced Ms Korpassy's stance on the importance of AI-related legislation by explaining that with the current AI regulation "we might still have the opportunity to promote the idea of sustainability risks as relevant for the categorizations of AI systems as part of the risk-based approach – which would lead at least to a little more transparency on the environmental impacts of AI systems".

Regarding the 2021 Coordinated Plan on Artificial Intelligence Review, she agreed that the Review might be more encompassing than the AI Act, "but a fundamental problem I see in it is, that we still lack specific plans for considering the sustainability impacts of AI". In other words, "we cannot solely focus on how AI can be used for sustainability goals" – specific propositions on how to tackle it are needed (for instance through the AI Act with its risk-based approach).

2.7.2 Digital sufficiency

A number of participants were interested in concepts around digital sufficiency and raised the issues of limiting the use of digital tools in ways to reduce energy and material consumption or redirecting digital tools in more sustainable directions. The question becomes how to allocate the resource consumption of the digital sector in a way that is equitable across society. The following discussions were included in this section: 1) **“How to balance ICT’s positive contribution and negative impact on the planet?”** (1 submission accessible [here](#)); 2) **“Should EU implement rules that limit data use of devices, online films, ads, etc.?”** (4 submissions accessible [here](#)); 3) **“How can we stop software being overloaded with unnecessary wasteful features?”** (2 submissions accessible [here](#)); and 4) **“Should we have eco-design rules for cryptocurrencies?”** (1 submission accessible [here](#)).

Participants discussed the concept of limiting digital consumption, either through regulation of types of media, digital tools, features, technologies, or data caps in order to reduce overall consumption in the sector. Others cautioned about the potentially regressive nature of such caps and advised also to look at the greening of the energy supply and technologies used in the sector. There could also be enhanced monitoring and transparency of usage in the ICT sector, for example with regard to the deployment of algorithms.

In a new topic of discussion, **Clementina Piani, Communication and Social Media Manager at Digital For Planet**, drew our attention to the fact that “digital technologies have the potential to unlock carbon emissions cuts as well as resource efficiency improvements. Nevertheless, their overconsumption and high electricity demand also cause a negative impact on the planet”. Startlingly, estimates show that ICT could consume 20% of global electricity by 2025 and generate 5.5% of CO₂ emissions by 2021. The point at issue here is how to balance the positive contribution and the negative impact of ICT on our planet.

Dr Monique Calisti, President of Digital for Planet, was invited to join a panel of experts at a recent [webinar](#) hosted by BDVA – Big Data Value Association on 2 December 2022. Dr Calisti identified “the lack of monitoring in various stages of ICT deployment as one of the issues of environmentally conscious digital transformation”. In spite of the growing political attention on sustainable ICT, this expert stressed “that there has not been enough attention to measuring the actual impact of data pollution”. Additionally, she suggested to increase transparency in order to be able to identify current and future issues within the sustainability journey. In fact, different players in the economy should be incentivised to share their consumption levels, which could help to develop tailored policies. Lastly, to tackle such issues, this stakeholder underlined the importance to encourage and foster

active knowledge exchange between ICT experts, sustainability experts, policy-makers, local governments, and small business owners.

Additionally, **Meadhbh Bolger, Resource Justice Campaigner at Friends of the Earth Europe**, created a topic of discussion “Should EU implement rules that limit data use of devices, online films, ads, etc.?”. She explained that “data use is growing exponentially because efficiency gains in the digital sector have a strong rebound effect”. Due to cheaper transmission, storage and processing of data, new applications emerge. Consequently, “innovations such as 5G, connected devices, and artificial intelligence push up the demand for ICT equipment and infrastructure, from servers and routers to data cables and antennas.” This expert asked if the EU should adopt eco-design rules that limit the data use of online films, videos, games, and advertisements, as well as connected devices.

Anne Mollen, Policy & Advocacy Manager at AlgorithmWatch, pointed out that this topic is important to address. She emphasized the need to find balance. For instance, regarding AI systems, “what size of a system is legitimate compared to its performance? How can we establish norms on this?”. For the moment, this expert recommended to raise awareness and knowledge about these issues, promote innovative ideas (for instance on small data, etc.) and rely on consumer choices.

Besides, **Clementina Piani, Communication and Social Media Manager at Digital For Planet**, indicated that recently the European Commission awarded the European Parliament Pilot Project – European Green Digital Coalition. The objective of this European Pilot Project is to develop common methods and tools to measure the net impact of green digital technologies. More information can be found [here](#).

For **Chris Adams, Director at The Green Web Foundation**, “this is now an emerging topic in the field of digital sustainability, but after working closer to the subject, I now think much of these ideas come from a flaw in the mental models we use for thinking about digital services work, and where the actual impact is”.

This expert noted that adding an extra tax on bandwidth is likely to have a regressive impact because of the current digital inclusion problem where poorer people pay more for data. Adding further charges can leave people with lower income to rely on cheaper, but limited access schemes. To illustrate his point, this expert shared an example: “many of the ideas related to calculating the impact of emissions from digital services work by creating a top-down model of all the energy used, and another metric like all the network transfer it enables, then dividing one by the other to work out a “energy per gigabyte” model, which is often

converted to carbon per gigabyte figure. This is relatively easy to understand, and legislate for, but it introduces all kinds of perverse incentives”.

Mr Adams shared few possible alternatives and solutions to this problem, such as “having a minimum, meaningful amount of free access available to everyone, from green sources may help, and it’s possible that you could add a levy on usage to cover the basic amount of connectivity to everyone, after which people would have to pay for further usage”.

Emphasis was also given on the need to incentivise action on the intensity, not the consumption. This expert recommended participants of the e-forum to read [this blog](#) written by The Green Web Foundation. According to him, “if the pollution is coming from the carbon emissions from burning fossil fuels to power the energy, then decarbonising the energy usage in the use phase by incentivising greener supply is likely a useful lever, that has lots of other handy co-benefits, like improving air quality, reducing exposure to expensive and volatile gas prices for energy and so on”. To illustrate his point, this expert shared [an example from the United States](#).

Most notably, he highlighted that there are gaps in how we measure impact: “many of the reports are explicitly being funded to focus on the positive aspects rather than discover trade-offs we make when we optimize for one sustainability metric over another”. On this matter, this expert recommended to read [this report](#) recently published by The Green Web Foundation.

Furthermore, **Meadhbh Bolger, Resource Justice Campaigner at Friends of the Earth Europe**, created another topic of discussion and this time reflected on overloaded software with unnecessary wasteful features. She asked participants on the online forum if anyone knows how to prevent software from being bloated with pre-installed features that are barely used, and with updates that require high amounts of memory, storage, or processing power. Consequently, these slow down devices, require more energy and resources for storage, and push users to buy new devices.

Although **Anne Mollen, Policy & Advocacy Manager at AlgorithmWatch**, could not provide an answer to her question, she indicated that this matter is important. Similarly, she is approaching her work on AI with this specific angle – “how big should an AI system be, how many parameters should it include, how much training time should be invested, when is the AI system’s performance good enough, how much data is sufficient for the performance I need?”. She is also trying to raise awareness about these issues with companies developing and implementing AI systems.

Lastly, in a new topic of discussion entitled “Should we have eco-design rules for cryptocurrencies?”, **Meadhbh Bolger**, highlighted that “Bitcoin’s method of validating transactions is a huge waste of computing power”. As a matter of fact, its electricity consumption approaches that of Netherlands, while Bitcoin mining hardware generates roughly the same amount of e-waste as the country of Luxembourg. Thus, this expert asked participants of the online forum if the EU should bring in eco-design rules for cryptocurrencies.

3. SURVEY

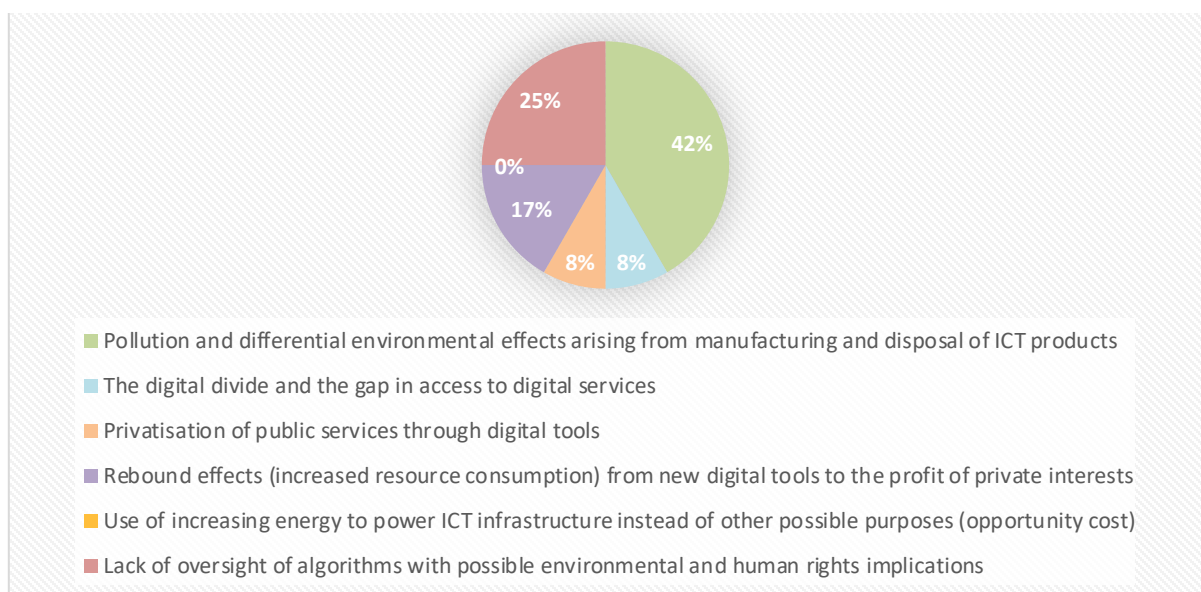
Based on the discussions that took place on the forum, a survey was set up on a selection of questions and sent to stakeholders after the closure of the forum. The survey was intended to better understand what the most important areas for action at EU level are. The results of this survey are outlined below.

The following questions were asked to stakeholders:

1. What is the single most urgent challenge for environmental rights arising from digitalisation?
2. Overall, do you think that digitalisation, as it is currently developing, will support or hinder the sustainability goals of the European Green Deal and Paris Agreement?
3. Have the recent EU legislative initiatives, the Digital Services Act, the Digital Markets Act, and the Artificial Intelligence Regulation, adequately addressed issues of environmental sustainability and environmental rights?
4. Have we seen a good example of jurisdiction using digital tools for enhanced consultative decision making or policy? If so, where?

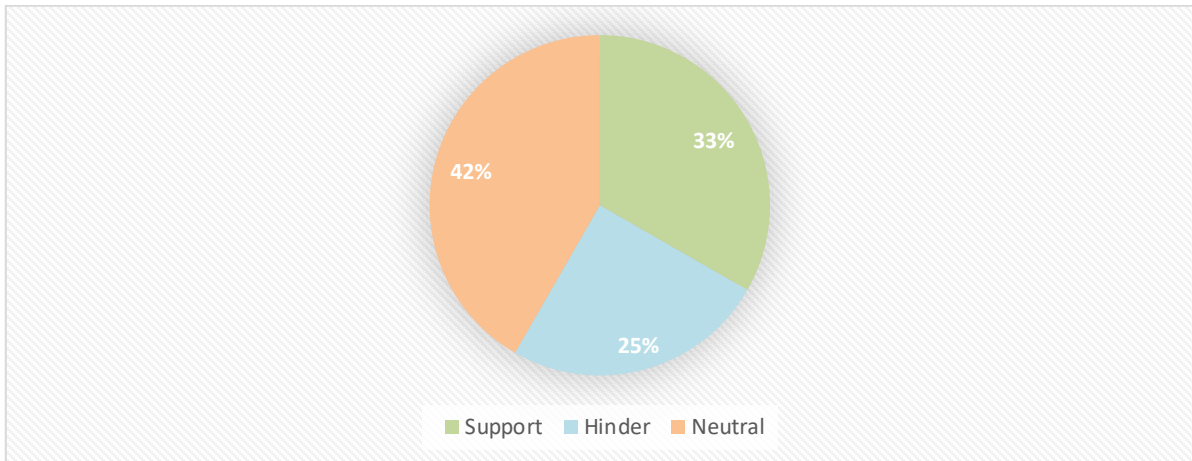
The survey was taken by 12 stakeholders. For the first question, 41.7% chose that "Pollution and differential environmental effects arising from manufacturing and disposal of ICT products" is the most urgent challenge, followed by "Lack of oversight of algorithms with possible environmental and human rights implications" (25%).

Chart 1: Responses to "What is the single most urgent challenge for environmental rights arising from digitalisation?"



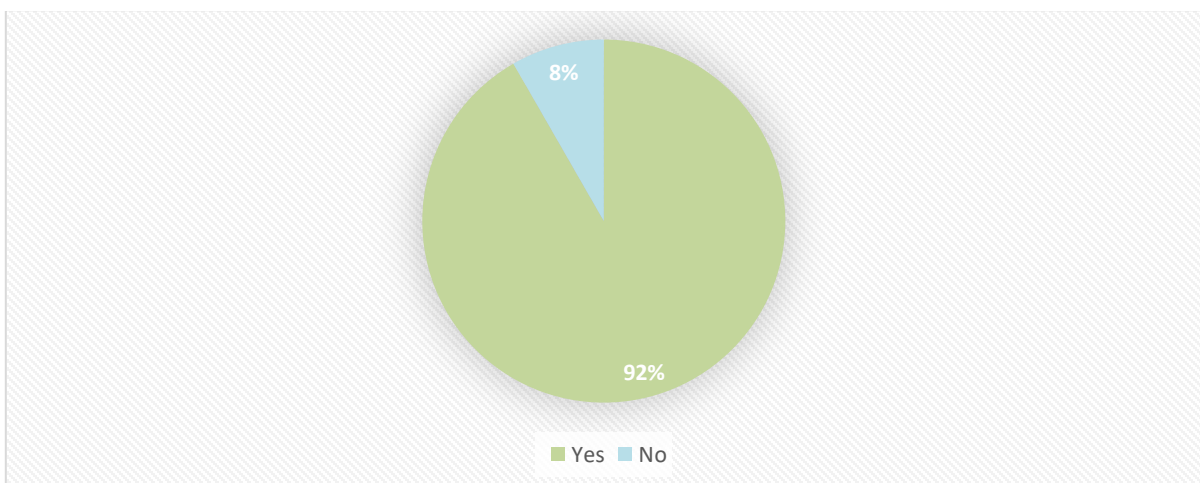
For the second question, 33.3% of respondents think that digitalisation will support the sustainable goals of the European Green Deal and Paris Agreement, whereas 25% think that digitalisation will hinder these goals. Almost half of the respondents (47%) were neutral.

Chart 2: Responses to “Overall, do you think digitalisation, as it is currently developing, will support or hinder the sustainability goals of the European Green Deal and Paris Agreement?”



Regarding the third question, most respondents (91.7%) think that the above-mentioned EU legislatives have not adequately addressed issues of environmental sustainability and equity.

Chart 3: Responses to “Have the recent EU legislatives, the Digital Services Act, the Digital Markets Act, and the Artificial Intelligence Regulation, adequately addressed issues of environmental sustainability and environmental rights?”



Finally, out of 12 people who took the survey, only 2 of them shared good examples of jurisdiction using digital tools for enhanced consultative decision-making policy. One of them shared the experience of Decidim in Barcelona (<https://decidim.org/>) and the work of the Engine Room at the EU level (<https://www.theengineeroom.org/>). Another respondent highlighted that Citizens Science can be an excellent way of harnessing the power of ICT to engage citizens. This respondent shared the example of the Telraam traffic flow monitoring camera (<https://telraam.net> and <https://we-count.net/>).

ANNEX 1: LIST OF PARTICIPANTS AND ORGANISATIONS

LAST NAME	FIRST NAME	ORGANISATION	POSITION
Adams	Chris	The Green Web Foundation	Director
Bas	Dursun	Istanbul Policy Center, Sabanci University	Project Coordinator
Berti Suman	Dr Anna	European Commission Joint Research Centre	Post-doctoral fellow
Bolger	Meadhbh	Friends of the Earth Europe	Resource justice campaigner
Dias Soares	Claudia	Portuguese Catholic Univer- sity	Professor of law
Ferrario	Ljuba	Generation Climate Europe	Digitalisation Project Co- Lead
Focke	Dr Jürgen	HelpAge Deutschland	Policy & Advocacy
Gajdics	Ágnes	Environmental Management and Law Association	Lawyer
Hafen	Frederik	European Environmental Bu- reau	Environmental Democracy Policy Officer
Haklay	Muki	University College London	Professor of Geographic In- formation Science in the De- partment of Geography
Hoadley	Suzanne	POLIS - Cities and Regions for Transport Innovation	Senior Manager, Traffic Effi- ciency Coordinator
Iranzo Dosdad	Alba	International Institute for Law and Environment	Environmental Lawyer
Kiss	Csaba	Justice & Environment	Coordinator
Macher	Konstantin	Digitalcourage	Campaigner
Marcus	Scott	Bruegel	Senior Fellow

Merkel	Sophia	Generation Climate Europe	Digitalisation project co-lead
Mollen	Anne	AlgorithmWatch	Policy & Advocacy Manager
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