IMPLEMENTATION PATHWAYS TOWARDS A JUST AND SUSTAINABLE DIGITAL TRANSFORMATION FOR PEOPLE AND THE PLANET

CODES

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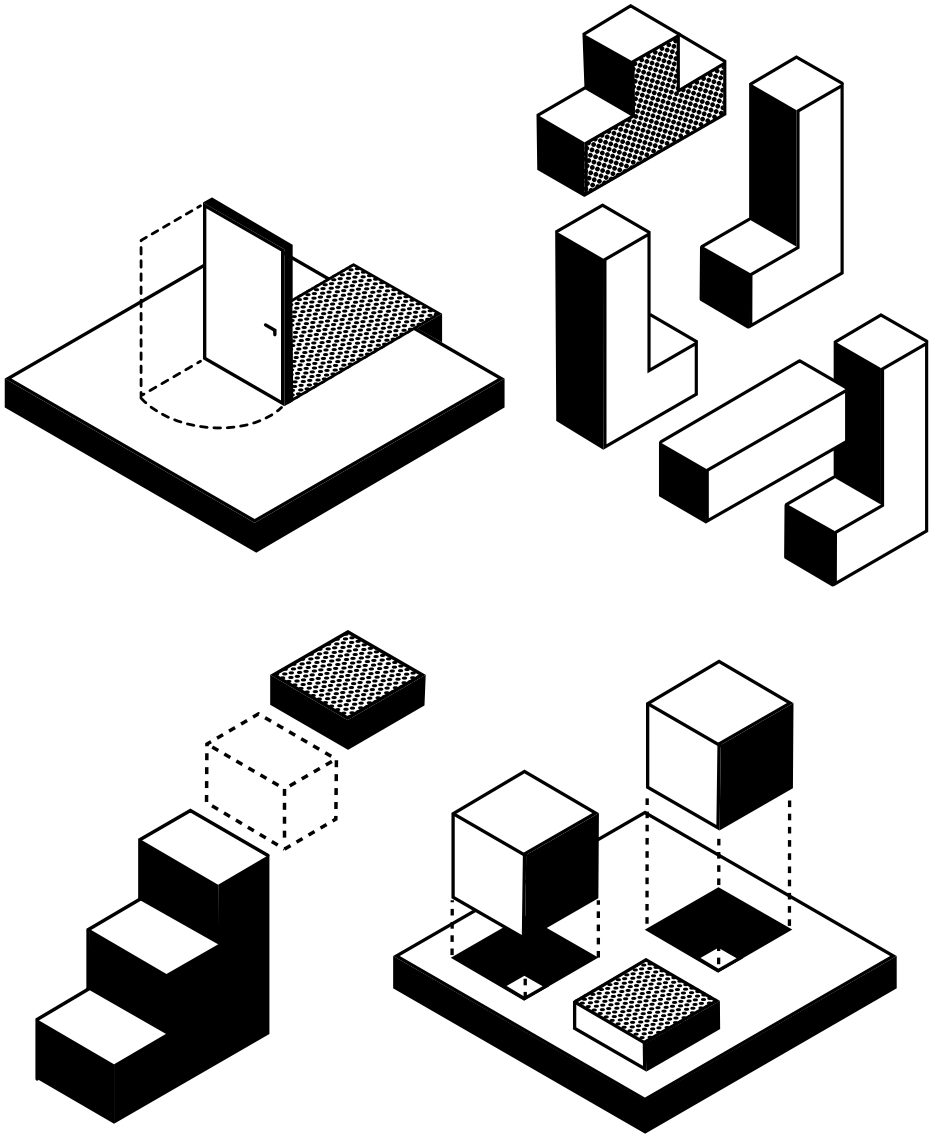

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INTRODUCTION AND METHODOLOGY

The pursuit of a just and sustainable digital transition for people and the planet requires action from different actors on a local, regional and global level. Based on the learnings identified in "Towards a Just and Sustainable Digital Transformation for People and the Planet - A policy paper for the Coalition for Digital Environmental Sustainability (CODES)", this paper provides insight on concrete leverage points, specific policy arenas and lines of action that can help align efforts to advance a just and sustainable digital transition. As part of a project commissioned by the German Environment Agency (UBA) on behalf of the Coalition for Digital Environmental Sustainability (CODES), the Berlin-based organizations Konnektiv, SUPERRR Lab and Green Web Foundation designed fifteen implementation pathways together with the UBA team. These offer a wide array of implementable action points for CODES and other actors.

The implementation pathways are a collection of ideas for sustainable digital transformation in regard to different transnational and international policy areas. They identify leverage points, the specific policy arenas, the most important relevant stakeholders and recommendations for future engagement. The implementation pathways include suggestions on where we feel the narrative needs changing, for instance in regards to including sustainability as a dimension in the ethical AI discourse. Some of the pathways connect the dots between actors, topics or policy areas, like setting global emissions reduction targets for digital services, and others suggest elevating new voices to have a say in policy arenas such as the climate action hubs. The implementation pathways are intended as conversation starters and are an invitation to connect with CODES and the actors involved in the CODES community.

The selection of topics for the implementation pathways was based on the gaps for action identified through the extensive research conducted for the paper "Towards a Just and Sustainable Digital Transformation for People and the Planet - A policy paper for the Coalition for Digital Environmental Sustainability (CODES)". We developed a template for ease of reading and modularity. After an initial topic selection, we conducted a workshop with the CODES network employing futuring methods, such as horizon scanning, signals, and backcasting. Aim of utilizing these methods was to identify the most feasible lines of action and most impactful goals, as well as to anticipate events that might call for a change of strategy.

This paper includes 15 implementation pathways:

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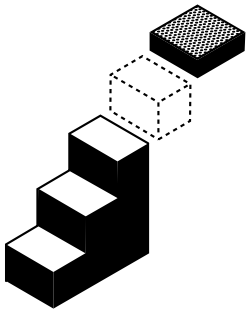
1. Setting Solid Standards
2. AI, Ethics, and Sustainability
3. Connecting Digital Public Infrastructure and Sustainable Transformation
4. Harnessing Open Source for Sustainable Digital Technology and Infrastructure
5. Connecting OSPO and CODES
6. Global Perspectives on the Right to Repair
7. Connect Climate Action Hub Networks
8. Understanding the Connection between Community Networks and Sustainable Digital Infrastructures
9. Set Global Emissions Reduction Target for Digital Services
10. Support and Collaborate with Initiatives that Counter Climate Mis- and Disinformation
11. Support Meaningful Connectivity within Planetary Boundaries
12. Systemic Risk Assessments Based on Mandated Sustainability Reporting
13. Learn and Transfer Governance Formats: The Multistakeholder Approach
14. Unlock new Policy Fora through NEXUS Dialogue Formats
15. CODES Post 2030



SETTING SOLID STANDARDS

Standard setting bodies as a means for a just and sustainable digital transition

BRIEF DESCRIPTION

Standards make digital technology possible: They harmonize technologies and enable people and businesses to connect online. Changing an internet standard potentially affects most digital services or applications. Changing them in a way that accounts for energy or resource consumption will affect the environmental impact of the digital sphere in a significant way.

Standards are not obligatory, but companies and service providers that do not follow an agreed standard will face difficulties in connecting to other services or their client base. The factual power of internet standards lies therefore in the interconnectedness of the digital world that cannot function without them.

Because of their importance, internet standards are discussed globally by the technical community. Standardization bodies in tech, e.g. the International Organization for Standardization (ISO), the International Electrotechnical Commission (IEC), the International Telecommunication Union (ITU), the Internet Engineering Task Force (IETF), the Internet Research Task Force (IRTF), the Internet Corporation for Assigned Names and Numbers (ICANN) and the World Wide Web Consortium (W3C), are long-standing institutions with strong networks and clear-cut processes. Regional bodies like the European Telecommunications Standards Institute (ETSI) organize regional exchanges on standards. While most are only open to representatives of national agencies or governments, some of them are relatively accessible even to people who lack an official institutional affiliation, as long as they have expertise or knowledge to contribute.

Standard setting provides an opportunity to influence tech development directly through harmonization and best practices that have the potential to be widely adopted and at a global scale. Some standardization bodies already have working groups for human rights or environmental impact assessments of technologies and standards (e.g. the working group on Human Rights Protocol Considerations, HRPC, or the working group on Environmental Impacts of Internet Technology, eimpact, both at the IETF). Advocates for a just and sustainable digital transition can form strategic alliances with these working groups and provide evidence that strengthens their standing in the technical community. In turn, advocates can provide a more holistic framing of digital sustainability that includes but exceeds environmental aspects to inform the work of these groups.

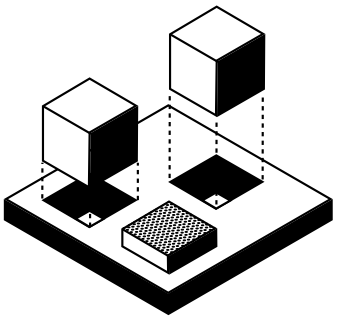
STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Advocate for sustainability impact metrics for standards with national representatives who are part of the closed standardization bodies • Reach out to existing working groups on environmental and legal impacts and facilitate exchange between the two. • Support global policy advocates and civil society experts on their journey into standard setting, e.g. through knowledge-sharing sessions, stipends, or networking. • Few standards currently deal with ICT and human rights and environmental impact. Community-run initiatives like the solar protocol can serve as an inspiration to formulate new ideas for needed standards together with the technical community.	Changes in internet and tech standards have a potentially global, far-reaching impact on digital services and digital infrastructure because most providers will adopt these changes once they are agreed. Standardization bodies try to keep day to day politics out of the debate and make the technical argument count. In a shifting political climate that de-prioritizes a just and sustainable digital transformation they provide a new field of advocacy that is equally impactful.

POTENTIAL PARTNERS
Since IETF is one of the most accessible standardization bodies, its working groups on human rights (HRPC) and environmental issues (eimpact) are good starting points to exchange knowledge and discuss ideas of impact assessments that bring human rights and environmental impacts together. Furthermore, the ITU-D study group for ICT in development; the Critical Infrastructure Lab for research on standardization and sustainability.

POTENTIAL RISKS AND TRAJECTORIES
Standardization bodies are not as receptive / not as accessible for seemingly outlying topics → work with organisations, national representatives and existing working groups that are already active in these bodies to support your arguments and ideas on the inside.

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• More standardization bodies do work dedicated to a holistic risk assessment of their outputs. • Environmental aspects and legal impacts are no longer viewed entirely separately.	Standard setting explores pathways not usually taken by global policy actors, with a few notable exceptions. It opens opportunities for better sustainability practices because they make sense from an engineering perspective even if the political climate does not favor them.

CONTEXT	*SOURCES AND FURTHER READING:*
IETF, ITU, UN	• Exclusionary Cultures of Internet Governance • Upgrading Governance for an Equitable Internet
standardisation for sustainability	
Mitigate negative impacts	
2025+	



AI, ETHICS, AND SUSTAINABILITY

Mainstreaming a sustainability perspective in the ethics of AI discourse on a global governance level

BRIEF DESCRIPTION

The AI discourse is relatively new in global policy, but it has led to the creation of several initiatives and policy fora that debate an ethical implementation of artificial intelligence (see: potential partners). So far, the AI and ethics discourse focuses mostly on the wellbeing of people through assessment of human rights impacts that arise during the wide-spread use of AI. The AI industry, however, has a significant impact on sustainability and the environment: water usage for cooling increases significantly with the development of AI applications. Microsoft is hiring nuclear engineers and explores running power plants to secure the energy supply for its data centres that host their AI product portfolio.

The legal and sustainable challenges of the AI sector are well known in global policy circles, but they are hardly ever thought of as two sides of the same coin: The production side and the deployment side of artificial intelligence that both have a massive impact on people and planet.
While AI is not the only driver of Big Tech's resource consumption, the ethics in AI discourse links more easily to sustainability than legal debates about other digital technologies. Actors in global policy who want to discuss a just and sustainable digital transformation in a broader context should use this opportunity to bring the discourses on sustainable and ethical AI together.

STRATEGIC ACTIONS FOR CODES

- Expand the frame of ethics in AI to signify "ethical for people and planet"
- Work with existing fora on ethics in AI to better understand how environmental, legal and social impacts are interwoven
- Work with ethics in AI bodies to provide a holistic assessment framework for AI industries
- Advocate for provisions for data centres and AI companies to publicly assess environmental, legal and social impacts on a regular basis

IMPACT

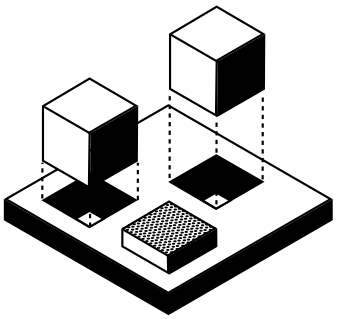
A domain-specific example of how to weave sustainability and environmentalism into a tech-specific debate can serve as a valuable blueprint for other emerging technologies.
Ethical (and human rights) considerations are an important part of the global discourse on AI. Many countries demand exhaustive assessments of the legal or environmental impacts of businesses, but since the two are usually separated, many social second-order impacts remain invisible in these assessments. Bringing the two together is a first step to change this, which in turn will influence global and transnational policy debates.

POTENTIAL PARTNERS
UNESCO initiatives such as the Global AI Ethics Observatory or the AI Ethics and Governance Lab for best practices and international exchange; The International Research Centre on Artificial Intelligence under the auspices of UNESCO for connecting AI and the SDGs; the Institute for Ethics in Artificial Intelligence (IEAI) and the Institute for Ethics in AI (Oxford) for joint research efforts and evidence for policymaking; the RenAIssance Foundation for coalition-building, the AI for Good Summit 2025 (spearheaded by the ITU) and the AI Action Summit 2025 in France as conferences to present the work of CODES.

POTENTIAL RISKS AND TRAJECTORIES
The AI debate is overshadowed by an unforeseen technical disruption, e.g. a sudden need for post-quantum computing and encryption. → Short term: Many issues like resource consumption are transferable; Mid-term: use developed blueprints from the AI discourse to advocate for holistic risk assessments and transparency provisions. CSOs critical of the AI debate reject working with a network focussing on it → Preventative: formulate a strong fundamental position that is not tech-solutionist.

INDICATORS OF SUCCESS	***THE BIGGER PICTURE***
• Relevant global AI bodies implement sustainability in their next conferences or guidelines • Policymakers understand that risk assessments from different expert domains are interconnected and need to be analysed together for a complete understanding of the challenges • Ethical AI is understood to mean ethical for people and planet	*Trustworthy AI* is another narrative that resonates on a global policy level (e.g. at the OECD) and might be compatible with questions of sustainability.

CONTEXT	***SOURCES AND FURTHER READING:***
UN, UNESCO	• UNESCO Recommendationson the Ethics for Artificial Intelligence • The Problem of Sustainable AI • Small Data for sustainability
AI, ethics and sustainability	
Mitigate negative impacts	
2050	



CONNECTING DIGITAL PUBLIC INFRASTRUCTURE AND SUSTAINABLE TRANSFORMATION

Ensuring sustainability is considered in the DPI discourse whilst Harnessing Digital Public Infrastructure for Sustainability

BRIEF DESCRIPTION

Digital Public Infrastructure (DPI) refers to providing digital platforms that enable access to various "foundational" services such as identification, payments, and data-sharing systems. The DPI discourse seeks to challenge tech monopolies and increase global agency in the digital world. DPI is becoming a central topic in digital policy discussions, which have shifted from focusing on digital commons to DPI. This has led to various critiques. Unfortunately, sustainability aspects are often overlooked in DPI planning and objectives. For instance, the G20 and UNDP's principles primarily focus on financial sustainability and service provision, neglecting environmental sustainability. There is a growing need for environmental audits to ensure DPI contributes positively to all sustainability goals. The physical infrastructure supporting DPI, such as data storage facilities, has a significant carbon footprint. These facilities must be designed sustainably, emphasizing green building standards and the procurement of sustainable ICTs.

DPI has a dual role in sustainability: it must be sustainable in itself and be utilized to promote climate protection and overall sustainability. However, there are significant social justice concerns. Zuckerman (2020) and Carnegie (2024) have noted that DPI risks being dominated by tech giants, potentially leading to monopolies and sidelining community and civil society voices, particularly on environmental issues. There is a notable gap in policies ensuring the sustainable operationalization of DPI. For example, e-ID systems could be designed in ways that exclude populations affected by the digital divide or those with low digital literacy. This exclusion risks denying essential services to people who cannot access or use digital identification.Therefore, Governments need to set clear agendas, action plans, and regulations to meet both civil right demands as well as sustainability targets and avoid greenwashing. CODES continue driving this topic together with UNDP and other partners involved such as Rockefeller Foundation and GIZ in order to champion sustainable DPI in various arenas.

STRATEGIC ACTIONS FOR CODES

- Continue engaging actively in DPI-related policy fora to advance more nuanced discussions around just and sustainable DPI in connection to CODES Impact Initiative 9 is on „Climate DPI".
- Promote the work of partners and CODES members like UNDP to ensure the discourse is advancing in an informed way.
- Building on Impact Initiative 9, CODES can foster stronger connections between community actors, including indigenous groups, and government bodies.

IMPACT

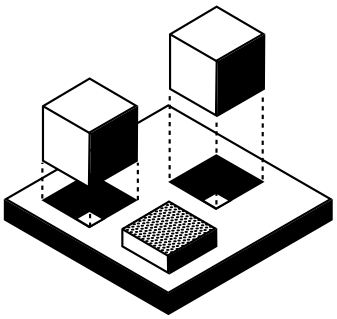
- ***Environmental Impact:*** Sustainable DPI infrastructure will contribute to reducing the carbon footprint associated with digital services, supporting global climate goals as well as to contribute to climate and nature protection or build synergies for communities connected to nature reserves.
- ***Social Impact:*** Ensuring that DPI is accessible and inclusive will help bridge the digital divide, empowering marginalized communities and providing equitable access to essential services.
- ***Economic Impact:*** By aligning DPI with sustainability goals, economies can benefit from the development of green technology sectors, leading to job creation and sustainable economic growth.

POTENTIAL PARTNERS
• Open Futures: A think tank focused on sustainable digital futures. • CSIS: The Center for Strategic and International Studies, which provides insights into global development issues. • Stakeholders working on topics related to the just and sustainable transition in connection to DPI are encouraged to connect with CODES Champions like UNDP: The United Nations Development Programme, which works on sustainable development goal and UN Environment Programme: An organization dedicated to encouraging sustainable development through sound environmental practices.

POTENTIAL RISKS AND TRAJECTORIES
Risk of DPI Replacing Digital Commons: There is a concern that DPI could overshadow digital commons, leading to a top-down, state-driven approach that may not reflect community needs or shifts in technology. ***Risk of Monopolization:*** DPI could become dominated by a few large corporations, potentially stifling innovation and excluding smaller actors.

INDICATORS OF SUCCESS	***THE BIGGER PICTURE***
DPI Alignment with Sustainable Development Goals: Success can be measured by the extent to which DPI initiatives support the achievement of SDGs, particularly those related to climate action, reduced inequalities, and sustainable economic growth.	DPI must be developed with a focus on addressing the digital divide, ensuring public access, and fostering economic development in a way that is environmentally sustainable. The interplay between these factors will determine the overall success and sustainability of DPI initiatives globally.

CONTEXT	***SOURCES AND FURTHER READING:***
UNDP Close the Digital Divide Realize Green, Digital, Just Transition 2030+	• G20 Policy Recommendations for Advancing Financial Inclusion and Productivity Gains through Digital Public Infrastructure (worldbank.org) • About Open Future • Addressing Climate Change with Digital Public Infrastructure • Report: Digital Public Infrastructure for Environmental Sustainability • Unpacking the Concept of Digital Public Infrastructure and Its Importance for Global Development



HARNESSING OPEN SOURCE FOR SUSTAINABLE DIGITAL TECHNOLOGY AND INFRASTRUCTURE

Open Source as a cross-cutting topic for sustainable digital transformation and eco-friendly technology design

BRIEF DESCRIPTION

Open Source technology is relevant to ensuring the digital transformation is sustainable in a number of different ways:

- Software obsolescence is becoming one of the key hindering factors for hardware sustainability. In turn, Open-source software can extend the life of older hardware by providing continued support and updates, even when commercial vendors have discontinued them. This reduces e-waste, as users can continue using their devices instead of discarding them.
- Open-source promotes code reuse, reducing the need for redundant development efforts. This not only conserves human and computational resources but also decreases the overall environmental footprint of software development. (green impact of “don’t reinvent the wheel”).
- Open-source principles include open knowledge which promotes the sharing of innovative and sustainable solutions’ designs. The Open Compute Project (OCP), for instance, shares designs of energy-efficient data center hardware. By making these designs open-source, OCP encourages companies to build and operate data centers that consume less power and are easier to cool. This approach has been adopted by major tech companies like Facebook, which has built some of the most energy-efficient data centers using OCP designs.
- Open-source promotes digital sovereignty which leads to more resilient ecosystems that are better able to handle the shocks and strains of modern economies.
- Open-source technology is being actively employed for climate action, such as:
  - → The Green Software Foundation (GSF) develops tools and principles aimed at creating energy-efficient software. For example, the Carbon Aware SDK, an open-source tool, helps developers build software that schedules tasks when the energy grid is greener (i.e., when renewable energy sources are more available). This reduces the carbon footprint associated with running software, particularly in cloud environments.
  - → CodeCarbon: This Python package tracks and reduces CO2 emissions from computing. By integrating it into machine learning workflows, developers can monitor and optimize the energy consumption of their models, which is crucial given the growing energy demands of AI and data processing tasks.
  - → Kube-green: A Kubernetes operator that reduces the CO2 footprint of clusters by scaling down non-critical workloads when they are not needed, effectively reducing energy consumption in cloud environments.
  - →

These are just a few aspects of how the concept of openness in tech relates to digital sustainability. Open Hardware, open data, open innovation and other aspects of openness are of equal relevance. This is also reflected in the current focus of the UN on OPSO. A number of actors, some mentioned above, are not only experts in the topic, but are actively promoting these concepts on the policy level, including new actions such as the German Open Hardware Alliance. Understanding the relevance of OS for sustainability and connection with these actors can be an important strategic next step for CODES.

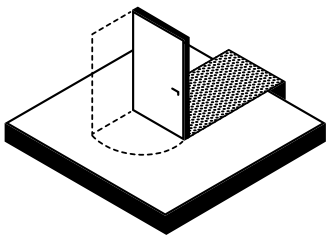
STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Get involved in Open Source Working Group of the Green Software Foundation • Provide deeper scientific analyses of the environmental sustainability effects of OS in regard to a holistic framework for sustainable digital infrastructures • Endorse the Principles for Digital Development • Recommend the adoption of OS as part of the CODES Impact Initiative 5 and CODES Action Plan.	• Reduction in carbon emissions through energy-efficient software and hardware designs, as exemplified by the Open Compute Project and the Green Software Foundation. • More efficient use of existing resources. • Foster innovation by enabling collaboration across industries and reducing duplication of efforts. • Ensure inclusivity by providing access to software and hardware that might otherwise be unaffordable, thus bridging the digital divide and enabling wider participation in the digital economy.

POTENTIAL PARTNERS
A number of organisations could be partners in harnessing open source for sustainable digital technology and infrastructure and potentially new collaboration partners for the CODES community, including • Green Software Foundation (GSF) is a non-profit formed under the Linux Foundation with the mission to create a trusted ecosystem of people, standards, tooling and best practices for building green software. • OHA - German Open Hardware Alliance - civil society nework advocating for open hardware in related policy fora • Free Software Foundation - The FSF is a nonprofit that defends the rights of all software users for the past 39 years. It offers initiatives, campaigns, events, and resources to support free software and fight against DRM, patents, and nonfree JavaScript. • The Open Source Initiative (OSI) is the authority that defines Open Source, recognized globally by individuals, companies, and by public institutions. OSI is driving a multi-stakeholder process to define an „Open Source AI“

POTENTIAL RISKS AND TRAJECTORIES
OS not being included in CODES and missing important alliances and global topic view → CODES should start forming alliances with OS experts and foundations in order to push OS as a driver of sustainable digital transformation in global governance

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• Aligning efforts with international sustainability policies and frameworks, such as the UN's SDGs, will amplify the impact and ensure that open-source initiatives are recognized and supported at a global level. • OS becomes standard for sustainable technology development	Open-source is a crucial element in the broader movement towards a more sustainable and equitable digital future. The open-source movement is not just a technological trend but part of a larger societal shift towards openness, shared knowledge, and collective problem-solving and addressing existing power imbalances, lock-in effects and monopolization.

CONTEXT	*SOURCES AND FURTHER READING:*
UN, GDC, OSPO	• Open Source Hardware and Open Design • Awesome green software – a list
Adopt Norms and Standard	
Create Knowledge Commons	
2030	



CONNECTING OSPO AND CODES

Engaging in the UN OSPO processes and discussion in order to ensure the potentials of Open Source for the three shifts is being harnessed

BRIEF DESCRIPTION

OSPO stands for “open source program offices”. The UN and member state run OSPO units are specialised in promoting a transition towards open source. They focus chiefly on software, but may potentially expand to other topics, including hardware, open innovation processes, data, etc. Building on previous OSPO events, in July 2024, an OPSOs for Good Symposium took place in New York and focussed on the role of Open Source Programme Offices (OSPOs) as centres of competency to accelerate sustainability by helping drive new forms of global cooperation around open source for good within countries. In particular, the objectives of the conference was to:

- Highlight the role of OSPOs in connecting and enabling the innovation ecosystem for open source in UN Member States, looking at key policy topics where open source is influencing the conversation between national and global ecosystems.
- Demonstrate how national and global cooperation policymaking can enable countries to deliver on the promise of open source for good, as well highlight concrete examples of where change is already happening.
- Capture insights around key themes in global policymaking and cooperation around open source and how they are driving a conversation about achieving the SDGs and delivering positive outcomes for society.

At the 2024 symposium, the UN shared that member states as well as funds, programmes and specialised UN agencies have been gradually implementing open source offices, developing communities of practice and suggesting that member-states should follow that lead. More of these offices are being planned in connection with the implementation plans for the GDC. This presents an opportunity for CODES. There is a recognition by the UN and a current dynamic connected to the topic in regard to the potentials of open source to accelerate progress towards the SDGs. CODES can tap into this dynamic and potential to ensure the right questions are being addressed and OSPOs strategies and actions are connected to the three shifts.This is particularly relevant as Open Source practitioners and veterans are critical of the current process in regard to the definitions and targeted stakeholder groups involved. In this context, key questions include. How to design and deploy openly governed technologies for the global majority, on each and all of the next seven (and more) generations of humanity? How to create open solutions that respect and improve the living conditions of humans and other living species? How to use openness as a driver for systemic change and as a technical paradigm for green digitisation?

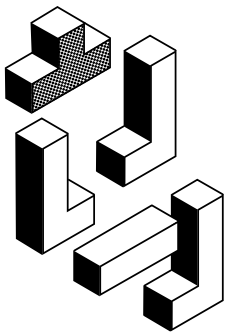
STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Engage in OPSO conversations and processes in order to lobby for the inclusion of the three shifts perspectives in the OSPO strategies and action plans. • Ensure these positions are anchored in the scope of new OSPO units being created. • Develop positions on Open Source policy in regard to the three shifts, building on CODES Implementation initiative Nr. 3, innovation 6 --> Action Plan Page 27 • Host conversation series with potential partners regarding embedding the CODES three shifts perspective in the work of OSPO	Drive conversation and dynamics connected to OSPO in a CODES direction, ensuring the OSPO units have a strong focus on sustainability related topics and foster relevant partnerships and programmes. CODES could play a pivotal role in ensuring the sustainability efforts of the different OPSO units are connected, have adopted the three shifts framework and are actively working with it.

POTENTIAL PARTNERS
Potential partners for this implementation pathway include the relevant UN bodies involved as well as relevant Open Source civil society actors, including: • Open Forum Europe • OSPO++ • UN Office of the Secretary General's Envoy for Technology • UN Office of Information and Communication Technology

POTENTIAL RISKS AND TRAJECTORIES
There is a current shift in conversation, based on observations from the recent summit, that indicates that along with the normalisation of Open Source as a driving technological concept for global development, a watering down of the more fundamental concepts of change connected to Open Source is taking place. There is a risk that if the focus is exclusively on open source as a more efficient way to develop software and hardware and a growing concern that this may lead to consolidating power structures. Open Source veterans and activists fear this may lead to an annexing of OS approaches rather than a more fundamental shift away from proprietary big tech business models and lock-in effects currently shaping digital ecosystems.

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• Concrete partnership between CODES and OSPO formed with CODES informing the work of OSPO in regard to OS for digital sustainability • OSPO Agenda incorporates CODES approaches and three shifts	This implementation pathway is connected to the implementation pathway: "Understanding the Relevance of Open Source for Sustainable Digital Technology" and the idea that CODES can incorporate openness in its approaches systemically.

CONTEXT	*SOURCES AND FURTHER READING:*
UN OSPO Enable Alignment - Develop Digital Competencies and Build Pioneering Coalitions 2025+	• Our Common Agenda – Report of the Secretary-General • UN Global Compact Strategy • Global Digital Compact • Commentary Friederike von Franque on the Global Digital Compact



GLOBAL PERSPECTIVES ON THE RIGHT TO REPAIR

Connect CODES with regional Right to Repair Policy Stakeholders and Initiatives to make CODES a champion for #Right2Repair advocacy

BRIEF DESCRIPTION

The #Right2Repair movement advocates for legislation to provide repair options, empowering consumers and promoting fair market competition. In the Global South, affordable repair services are crucial, and #Right2Repair becomes essential due to economic factors, extending device lifespans and supporting sustainability. Insufficient legal frameworks and minimal influence on global manufacturing requires international collaboration, localised advocacy, and tailored solutions.

Currently, the global #Right2Repair movement faces restrictive manufacturer practices, intentional planned obsolescence, and limited access to repair information. This restricts consumer options, promotes electronic waste, and hinders access to essential tools and documentation. Manufacturers prioritise profit, create complex products and discourage DIY repairs. Whilst in Europe the focus is on creating new manufacturer-customer-product relations, the global #Right2Repair movement aims to empower those without access to these formal consumer protected markets but live with the effects of the waste of the so-called 'Global North' (leave no one behind).

Global digital environmental sustainability policy actors, including the CODES community, can become an advocates and connecting points for the #Right-2Repair movement. Championing the movement could include supporting different regional policy actors and initiatives working toward the inclusion of digital products and goods as well as the inclusion of software obsolescence in the #Right2Repair as well as generally promoting topics at the intersection of digital sustainability and repair. CODES can include the #Right2Repair in its narrative in the context of autonomy through repairability and consider the social dimensions and the end of the line when it comes to hardware products. Further, CODES can support examining how to transfer the right into a global convention.This includes developing a legal perspective on how to transform the regulatory regime to materialise #Right2Repair on different levels. A new form of regulatory structure should be pursued for the #Right2Repair and CODES community members can enable these governance models through new alliances.

STRATEGIC ACTIONS FOR CODES

- Meet with #Right2Repair policy and advocacy organisations to identify collaboration potentials
- Study the legal perspective on how to transform the regulatory regime to materialise #Right2repair on different global governance levels
- Advocate for #Right2Repair on a global scale beyond the scope of products covered by the EU eco design guidelines
- Publish a CODES paper on #Right2Repair in relation to Shift 2

IMPACT

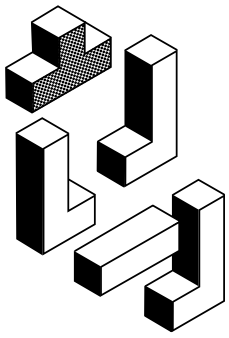
This implementation pathway pays into the CODES Shift 2, in particular minimising material base and addressing consumption drives

POTENTIAL PARTNERS
A multitude of community projects exist that often lack a seat at the table in policy processes but have much to contribute to digital sustainability, such as Community Creativity 4 Development, an NGO connecting communities while finding solutions to protect the environment from global warming. Further, there are a number of regional stakeholders advocating for the Right to Repair, for example Policy Lab Africa, the Maintainers Netzwork, the European Restart Project, which aims to tackle the climate emergency by making electronics work for people and for the planet and Repair.EU

POTENTIAL RISKS AND TRAJECTORIES
Currently, there is a big power shift as producer responsibility is diversified. There is a risk of #Right2Repair not reaching its full transformative potential and being limited to too few products, to few consumer rights and lacking free market structures. → Creating strong movements around this topic and strengthening actor groups advocating for a more fundamental approach to the #Right2Repair in the context of responsible consumption, global responsibility and degrowth can help mitigate this risk.

INDICATORS OF SUCCESS	***THE BIGGER PICTURE***
• #Right2Repair policy organisations join the CODES network and vice versa • Right to Repair established in global policy frameworks, including digital devices and software powering “smart” products	#Right2Repair should be viewed as a mechanism of regulating state-driven/liberal markets and there are different dimensions in terms of the implications of the law and regulation regime.

CONTEXT	***SOURCES AND FURTHER READING:***
Right2Repair directive	• An overview of Europe’s repair sector, EEA activity Circular Economy and Resource Use • Universal Circular Economy Policy Goals
Minimize Material Base	
Catalyse Sustainable Circular Economy	
-2028	



CONNECT CLIMATE ACTION HUB NETWORKS

Explore and foster connections between Climate Action Hub Networks in order to connect and scale their efforts

BRIEF DESCRIPTION

Innovation hubs across the globe play a pivotal role as convening points for local technology ecosystems and incubators for new technological developments. Many hubs play an educational or business development role for innovators and their digital products and act as knowledge exchange and scaling points for digital innovation.

There are a number of networks of innovation hubs on national, regional and international levels who are involved in policy processes, in particular regarding digital and innovation related policy matters. Some networks exist with a dedicated focus on climate action including the CODES ClimateAction Innovation Hub Network, UNDP Accelerator Labs, the Global Innovation Gathering and the FabCities network.

These networks have similar missions to innovate, pilot and scale solutions for climate action and engage in relevant policy processes. FabCities for instance has built an Open Source stack for circularity management in cities and connects city officials globally. GIG for instance connects to national hub networks and their policy related and enables global exchange between actors involved in sustainable technology creation and related policy areas. Such networks can benefit from mutual exchange of knowledge and can become action partners in representing common policy matters on different political levels.

Connecting and exploring ways to collaborate between hub network can help scale CODES efforts and impacts. Knowledge and resources sharing opportunities can be created, partnerships could further include data collection and piloting of concepts and initiatives through hub networks as well as exploring ways to engage in coordinated policy action from the city, national, regional to international level on matters of common interest. In summary, CODES can connect with climate action hub networks to support the

- Scaling and sharing of knowledge around climate relevant innovative digital technologies and approaches
- Engaging as policy actors and driving bottom-up policy dialogues, in particular on the municipal and regional level (see Barcelona's IAAC, see Accra's Impact Hub and Ghana's National Hub Network)

STRATEGIC ACTIONS FOR CODES

- Overview assessment of relevant hub networks and their activities
- Hosting of conversation series to explore mutual policy interests and means of intervention
- Assessment of cooperation potential with the aim of designing future joint engagement in projects and policy processes
- Creating a "Sustainable by design" toolkit

IMPACT

- This pathway feeds into Shift 3, Impact Initiative 7. It will enable CODES to connect with an international network of hubs working toward public innovation potential and use of sustainable technology creation with a focus on climate protection
- This pathway will help empower an important actor group by enabling them to tap into the knowledge and resources of the CODES network, thereby

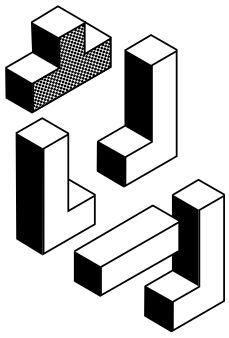
STRATEGIC ACTIONS FOR CODES	*IMPACT*
	strengthening their intervention potential • At the same time, for CODES, this pathway can have wide scale impact in terms of engaging new actor groups with activities in relevant policy arenas through a networked approach

POTENTIAL PARTNERS
• Global Innovation Gathering (GIG) is a vibrant, diverse community of innovation hubs, makerspaces, hackerspaces and other grassroots innovation initiatives. GIG contributes to creating and using open, inclusive and sustainable technologies and meaningful connections between innovators, positively impacting the policies and frameworks for grassroots innovation. • The Fab City Global Initiative, launched in 2011, is a collective of civic leaders, makers, urbanists, and innovators dedicated to transforming urban industrial paradigms for a sustainable future. • The UNDP Accelerator Labs is the world's largest and fastest learning network on wicked sustainable development challenges. Co-built as a joint venture with the Federal Ministry for Economic Cooperation and Development of Germany and the Qatar Fund for Development, the Network is composed of 90 Lab teams covering 115 countries and taps into local innovations to create actionable insights and reimagine sustainable development for the 21st century.

POTENTIAL RISKS AND TRAJECTORIES
• This is a process involving many grassroot actors and a bottom-up process, a new actor group for CODES and a potentially new policy arenas to engage with • Creating new ties and alliances with network actors, as well as building trust and finding a common working language can take time • The risk of investing too much time in an exploratory process can be mitigated through strategic facilitation of such a process and a clear set of intended goals and outcomes (for instance sharing the CODES ressources with more city level policy actors through the mentioned hub networks)

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• Established cooperation with climate relevant digital innovation hubs to initiate mutual learning process • All hubs integrate training offers on sustainable by design tech development for their communities and discuss local contexts and related policy matters and feed this back to CODES.	Not all technology is created by big tech companies, many innovators across the world are developing software and hardware products and many of them are connected to innovation hubs that act as incubators and local ecosystem conveners. It is crucial for these actors to embrace the concept of sustainability by design. Further, local actors can continue and translate policy dialogues from the global to the municipal, national and regional level.

CONTEXT	*SOURCES AND FURTHER READING:*
Unlocking new actor groups and policy arenas while forming new long term alliances	• Shaping the Future of Makerspaces in Africa & Europe: Recommendations for Policy Makers, mAkE, 2024 • Report on National and Regional Hub Associations Including 7 Documented Case Studies and Comparative Analysis, mAkE, 2023
Digital innovations	
Ongoing	



UNDERSTANDING THE CONNECTION BETWEEN COMMUNITY NETWORKS AND SUSTAINABLE DIGITAL INFRASTRUCTURES

Building Connectivity While Empowering Communities and Supporting Sustainability Goals

BRIEF DESCRIPTION

Community wireless networks provide a decentralised, bottom-up approach to digital connectivity, enabling people in underserved areas to access the internet while also promoting digital sovereignty. These networks are not only crucial for providing access to digital services but also align with broader goals of environmental sustainability. Sustainable digital infrastructures emphasise the use of energy-efficient technologies, green energy sources, and a commitment to minimising the ecological footprint of digital systems, making these initiatives a natural partner in efforts to build a more inclusive, sustainable internet. In Europe, the most well-known community networks are Guifi in Catalonia, Freifunk in Berlin, Ninux in Italy, Funkfeuer in Vienna and the Athens Wireless Metropolitan Network in Greece. They exist around the world and fulfil many important functions including providing connectivity for otherwise unserved communities.

- ***Digital Sovereignty and Community Control:*** CWNs enable communities to own and manage their own internet infrastructure, enhancing local digital sovereignty. This approach gives people more control over their data, privacy, and services, in contrast to traditional telecom models dominated by large corporations. ***Example***: According to the UN IGF report, initiatives like those from the Dynamic Coalition on Community Connectivity highlight how community networks have become critical tools for fostering digital sovereignty in areas where state or corporate control is either too costly or undesirable
- ***Environmental Sustainability:*** These networks align with sustainable development goals by incorporating energy-efficient technologies, such as solar-powered network devices and low-energy communication protocols. Utilising energy-efficient communication protocols can reduce the carbon footprint of digital infrastructures, crucial for mitigating the environmental impact of expanding digital connectivity ***Example***: Solar Wi-Fi solutions like offer a sustainable and cost-effective way to bridge the digital divide and provide reliable connectivity in remote areas.An example of a CN using solar energy is the Battery Operated System for Community Outreach (BOSCO) based in Northern Uganda.
- ***Addressing the Digital Divide:*** CWNs help bridge the gap in internet accessibility, particularly in remote or low-income communities, by creating affordable, locally managed network solutions. ***Example***: The Guifi.net project in Catalonia, Spain, is a leading example of a CWN that has empowered rural communities by providing affordable internet access while promoting local digital sovereignty
- ***Synergy with Sustainable Digital Infrastructures:*** CWNs can be integrated with green energy solutions such as solar or wind-powered systems to ensure that meaningful electrification for rural communities goes hand in hand with bridging the digital divide and future networks operate in an environmentally friendly manner. ***Example***: The UPC report emphasises the importance of leveraging renewable energy sources in community networks to promote sustainable connectivity. This includes case studies of networks powered by solar panels, which reduce reliance on fossil fuels.In such initiatives, efforts for meaningful electrification can go hand in hand with efforts to enable meaningful connectivity.
- ***Low-Cost and Scalable Solutions:*** CWNs offer low-cost solutions to connectivity problems by using inexpensive hardware like Wi-Fi routers and mesh networking technology, making them scalable and adaptable to various community needs. ***Example***: The IEEE report details how mesh networking allows community networks to scale organically, as each new node strengthens

BRIEF DESCRIPTION
the network, making it more robust and affordable over time. These above mentioned topics can be integrated by CODES in its work on sustainable digital infrastructure. CODES can connect conversations around access, bridging the digital divide and contributing to green digital growth and, particularly the ITU could collaborate to enable connecting the stakeholder group of sustainable community networks access to global policy forums.

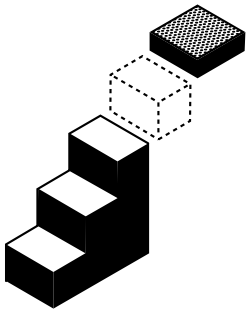
STRATEGIC ACTIONS FOR CODES	***IMPACT***
• ***Partnership Development:*** CODES can play a pivotal role in linking community wireless network projects with sustainable energy and digital infrastructure experts to amplify the environmental and social impact. • Guide discussions around ***Energy-efficient Design:*** Integrating energy-efficient networking protocols and hardware solutions into community wireless networks to minimise energy consumption and reliance on non-renewable energy sources. • ***Regulatory Advocacy:*** Engaging with policymakers to advocate for supportive regulatory frameworks that incentivize the creation of sustainable digital infrastructure connecting with community networks.	Community wireless networks foster digital inclusion, addressing the digital divide by providing access to remote and underserved areas. By coupling this with energy-efficient, sustainable technologies, these initiatives help reduce carbon emissions linked to the operation of digital systems, supporting the global shift toward greener economies. Additionally, they empower local communities by promoting digital sovereignty and resilience, contributing to long-term, sustainable development goals.

POTENTIAL PARTNERS
Association for Progressive Communications (APC) is an international network of civil society organisations that advocate for a free and open internet, while also working on community networks in rural areas, emphasizing environmental sustainability in their work. • ***Partnership Opportunity:*** The CODES community could work with APC to implement environmentally sustainable practices in community networks and amplify advocacy efforts around digital sovereignty. Rhizomatica (***Mexico***) works on providing community cellular networks in rural areas of Mexico and other Latin American countries. Their focus is on helping people build and manage their own communication infrastructures, especially in remote indigenous communities. • ***Partnership Opportunity:*** The CODES community can partner with Rhizomatica to understand the needs and effects of sustainable wireless connectivity in underserved regions and exchange best practices on energy-efficient designs.

POTENTIAL RISKS AND TRAJECTORIES
• ***Policy and Regulatory Challenges:*** Unfavourable regulatory environments can limit spectrum access or impose constraints on community-driven networking projects. • Not bridging digital divides or doing so in an unsustainable way can deepen social inequalities and lack of equal opportunities, increasing economic disparities.

INDICATORS OF SUCCESS	***THE BIGGER PICTURE***
• ***Increased Digital Access:*** Measuring the number of previously underserved communities that gain access to the internet via these networks. • ***Energy Efficiency Gains:*** Quantifying the reduction in energy consumption and emissions linked to the operation of these networks. • ***Policy Changes:*** Tracking improvements in the regulatory environment that facilitate the growth of community networks and sustainable infrastructure projects.	Community wireless networks represent a shift away from centralised, corporate-driven internet in frastructures toward a more democratic, decentralised model. These networks not only empower local communities by granting them control over their digital futures but also promote sustainability by integrating green energy and energy-efficient technologies. These initiatives resonate with global digital sovereignty movements and environmental sustainability goals, paving the way for a more equitable and ecologically conscious internet.

CONTEXT	***SOURCES AND FURTHER READING:***
UN, IGF rural communities Close the Digital Divide 2030	• Official Outcome of the UN IGF Dynamic Coalition on Community Connectivity: Community Networks - Building Digital Sovereignty and Environmental Sustainability • Sustainable Wireless Networks: Energy-efficient Communication • UPC Research: Community Networks and Sustainability



SET GLOBAL EMISSIONS REDUCTION TARGET FOR DIGITAL SERVICES

CODES becomes a catalyst for a CO2-emissions reduction target for digital services on a global scale

BRIEF DESCRIPTION

The Paris Agreement made clear that global warming needs to be limited to 1.5 degrees Celsius. In 2020, the International Telecommunications Union (ITU) found that to stay on track for this scenario, the ICT sector needs to reduce its absolute CO2-emissions by 45% by 2030. However, the International Energy Agency points to the doubling amount of energy needed for digital services between 2024-2026, with AI systems growing exponentially to consume at least ten times their demands in 2023.

Given the significant emissions from digital services and projected growth rates in energy demand, a global emissions reduction target towards Net Zero is needed. This target could be established on a global governance level using existing mechanisms. CODES could become an advocate for setting an emissions reduction target for digital services — leveraging the existing governance mechanisms for tracking progress. It could catalyze the proposal in key fora and push for standardized and publicly verifiable open data on digital emissions.

Part of this effort would include advocating for this target at a political level, also as a follow up for the environmental sustainability principle of the Global Digital Compact. The other part would be to ensure the data standards and reporting implementation could deliver towards this target. Currently, there is a lack of publicly verifiable data on emissions from digital services. The data that does exist is often not comparable, held by corporations, or inaccessible to independent analysis. As recent examples show, these reports and data points are often flawed or one-sided and seem to be designed to justify further investment into digital services rather than assess them on their merits. Therefore, working towards a global emissions reduction target would also require open and standardized data, aggregated at the country level.

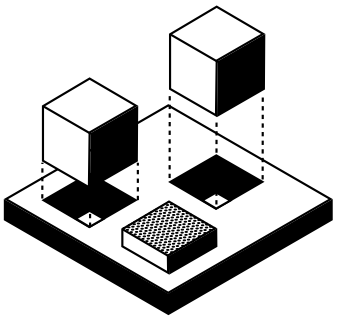
STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Advocate to set a global emissions reduction target • Leverage existing mechanisms to support tracking digital emissions towards a target, such as a net-zero target for digital infrastructure • Support open and standardized reporting data on digital emissions	• Creation of an ecosystem on emissions reporting on a global scale • Independent reporting and open data on digital emissions ensures less greenwashing • Connection of digital emissions on a country level and COP level creates accountability • Innovation and incentivisation on digital emission reporting • Meaningful climate action on a global scale

POTENTIAL PARTNERS
CODES can collaborate with international and national research institutions that are specialized on open data and open code to ensure independent, open, data-informed discussions about digital emissions. For example, ITU has already started to track this target. Existing CODES members that work close to their country ministries should also be leveraged, for example UBA in Germany. Civil society organizations that want to get involved can act as watchdogs and transparency drivers and can potentially be promoted in a multistakeholder process. Industry bodies that are interested in data-informed discussions on digital emissions and net zero can become part of the movement.

POTENTIAL RISKS AND TRAJECTORIES
Countries do not want to report their digital emissions → Learn from other reporting efforts Countries opt-out of the emissions reduction target → Foster democratic participation in global governance processes and promote a target Countries manipulate the reporting, and it becomes an intransparent and flawed process → Invest in independent research institutes to create a controlling mechanism The quality of data is poor → Build a global network of experts that support on data quality, open data, and transparency Corporations don't report accurately, or delay reporting because they claim they don't have access to the data from their supply chain → Encourage transparent supply chain reporting mechanisms globally

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• Digital emissions are connected and discussed in global fora as another data point to climate change • Decision-makers understand the effort needed for decarbonisation and net-zero • Independent organizations that are not only industry-led emerge and collect open data on digital emissions on a country level	The aviation or shipping industry have already defined emissions targets. Yet, digital emissions are largely kept vague and unclear. Only recently, The Guardian found that data center emissions are probably 66% higher than what big tech claims. Enablers for this pathway are therefore open data, open code, open source tooling, transparency, and strong networks of independent researchers and civil society organizations.

CONTEXT	*SOURCES AND FURTHER READING:*
Global policy fora	• International Energy Agency on emissions of Aviation Industry • Data center emissions probably 662% higher than big tech claims. Can it keep up the ruse?
Mitigate Negative Impact - Impact Initiative 4 Harmonization of Digital companies' GHG inventories	
-2028	



SUPPORT AND COLLABORATE WITH INITIATIVES THAT COUNTER CLIMATE MIS- AND DISINFORMATION

Climate mis- and disinformation delays climate action. CODES can support and collaborate with local initiatives across the globe that work on countering climate mis- and disinformation

BRIEF DESCRIPTION

Mis- and disinformation (misinformation as the unintentional spreading of false information, disinformation as the strategic spreading of false information, for example by intelligence services) pose a serious threat to democratic processes across the world. According to the Global Risks Report, mis- and disinformation are ranked as the highest short-term risk to humanity. The majority (58.5%) of internet users worldwide is worried about misinformation, particularly young and low-income groups.

Climate mis- and disinformation significantly delays climate action. Mis- and disinformation environments are very complex, involving several actors such as politicians, think tanks, influencers, and advertisers. Also digital platforms play an integral role in the dissemination of climate mis- and disinformation. Their business models are based on economies of attention, profit, and virality. There is a lack of platform policies on transparency, fact-checking, and accountability. Additionally, big tech themselves engage in greenwashing claims about their own environmental impact.

Healthy information ecosystems that are built on fact-checked information, transparency, and trustworthy journalism are urgently needed. Big tech needs to be held accountable, particularly on their greenwashing efforts. A way forward is the support and collaboration with initiatives that counter climate mis- and disinformation of big tech. CODES can become an active supporter and collaborator of these initiatives, benefiting from the global nature of the coalition. As mis- and disinformation travels across countries and languages, international collaboration is urgently needed. In addition to Shift 2 - Problem 4 in the Action Plan, CODES can build case studies on the environmental impact of digital technologies, as well as greenwashing impacts of green tech together with local initiatives. What is additionally needed is fact-checked information on the environmental impact of digital technologies. CODES can play a crucial part in building this information base.

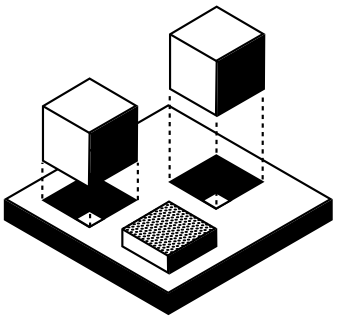
STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Host a networking event with different initiatives (see: potential partners section) to explore the role of climate mis- and disinformation in global governance initiatives; with a specific focus on exploring problem 4 in the Action Plan further • Work with Climate Action Against Disinformation (CAAD) on a case study to help counter the greenwashing efforts of Big Tech • Support industry efforts and corporate advocacy that counter climate mis- and disinformation, such as coalitions between businesses and advocacy groups	• A common understanding with the CODES champions on the role CODES can play in countering mis- and disinformation across languages and governments. • Fact-checked, trustworthy, and reliable information on the environmental impact of digital technologies that can be used by different global and local actors

POTENTIAL PARTNERS
• CAAD for holding big tech's greenwashing efforts accountable and bringing greenwashing efforts to the forefront of global governance; Conscious Advertising Network for corporate advocacy on mis- and disinformation that would allow a collaboration with interested industry actors as well; ACT Climate Labs for effective climate communications and providing skills to journalists or activists on this topic; Stop Funding Heat as a local initiative that could benefit from a global network; and also collaborations with investigative journalists and newspapers, such as The Guardian or The New York Times to show the need for journalism within climate mis- and disinformation and create stories on the environmental impact of digital technologies;

POTENTIAL RISKS AND TRAJECTORIES
General distrust in public institutions and coalitions (such as CODES) → engage with civil society and be as transparent as possible Hijacking of mis- and disinformation efforts by corporates → clarify why each initiative joins the network, how it is funded, and what are its interests; Create an open database;

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• A collaboration with an initiative, such as the CAAD, shows the global relevance of the topic, and the way forward for multi-stakeholder approaches • Fact-checked and downloadable information on the environmental impact of digital technologies, such as resource use or the energy impact of data centres, on the CODES website. • A collaboration with journalists that investigate data on the environmental impact of tech, and also create stories around it	42% of Europeans have social media as their primary news resource. Yet, hate speech and mis- and disinformation are on the rise. The space for meaningful public debate is increasingly shrinking. Whether it is paid speech, PR campaigns, climate scepticism, greenwashing, targeted harassment of climate activists, false facts or simply chaos strategies – there are a multitude of issues. Digital platforms often reinforce wrong information about climate, rather than providing meaningful facts about sustainability. This leads to a delay in climate action.

CONTEXT	***SOURCES AND FURTHER READING:***
Informing	• Green Screen - Digital Rights and Climate Justice Report • Discourses of Climate Delay • Cashing in on Climate Delay - Big Tech's Role in Greenwashing the Fossil Fuel Industry
Climate and journalism	
Mitigate Misinformation	
-2035	



SUPPORT MEANINGFUL CONNECTIVITY WITHIN PLANETARY BOUNDARIES

CODES becomes an active supporter of meaningful connectivity initiatives that work within planetary boundaries – showing the need for community-based access to the Internet that does not cause environmental harm

BRIEF DESCRIPTION

According to the latest State of Broadband report, one third of the world's population still remains offline in 2024. Data suggests that the so-called "digital divide" perpetuates inequalities such as gender disparities, economic opportunities, access to healthcare, or educational opportunities. The UN Secretary-General Envoy on Technology and the ITU have set the target for universal and meaningful digital connectivity by 2030. But how can this target be achieved while respecting planetary boundaries?

The Doughnut Economics model, developed by Kate Raworth, can be an interesting approach, as it combines the idea of a social foundation, so the basic needs of a society, with planetary boundaries, the basic needs of a healthy planet. The potential of the model lies in its possibility to connect it to existing frameworks such as the Sustainable Development Goals (SDGs) that connect the complex relationships between the goals, allows for holistic thinking, and enables decision-making. This needs-based approach to digital services can ensure that basic rights such as Internet access for everyone are met, but that the Earth's life-supporting systems are protected. Between the social foundation and the planetary boundaries lies a doughnut-shaped space that is both ecologically safe and socially just: a space in which humanity can thrive.

Used as a policy framework, this model is already in effect in the City of Amsterdam and elsewhere to ensure a more informed discussion about the tradeoffs of digital services investments and an understanding that it should provide foundational social services and yet not overshoot critical lifesystems.

CODES can support initiatives that work on meaningful connectivity across the globe and truly promote digital inclusion. It can also show the value of working with the model, for example in training workshops for CODES champions. It can particularly advocate for community-centred approaches, such as wireless community networks and community network initiatives, to connectivity that are affordable and work within planetary boundaries to those people who need it the most.

STRATEGIC ACTIONS FOR CODES

- Clarify the connection between meaningful connectivity and planetary boundaries through a position paper and case studies, for example with APC (see potential partners section)
- Collaborate with Doughnut Economics Action Lab to define the planetary boundaries of digital services
- Run a workshop with Doing the Doughnut Tech to explore the value of connecting digital tech with the Doughnut Economics model
- Provide offline information materials on climate and the environment to unconnected communities

IMPACT

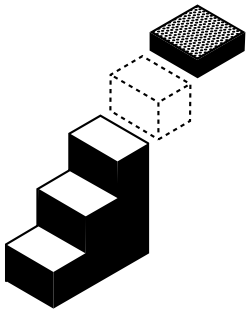
- The UN meaningful connectivity target is well understood in the light of planetary boundaries
- Meaningful connectivity is understood from environmental, cultural, political, gender, and community perspectives – not only from Internet access

POTENTIAL PARTNERS
Collaboration with Association for Progressive Communications (APC) (become a guest on the Routing for Communities-Podcast). Collaboration with Digital Infrastructure Insights Fund with a special focus on planetary boundaries. Collaboration and/or networking events with ISOC and Connect Humanity to explore the question of planetary boundaries together. In Germany, opportunity to collaborate with wireless community network initiative Freifunk.

POTENTIAL RISKS AND TRAJECTORIES
• Artificial trade-offs between meaningful connectivity and planetary boundaries → Support initiatives that showcase the benefits to work at this intersection. • Rise of authoritarianism across the world endangers meaningful connectivity efforts → Foster civil society initiatives such as APC or Connect Humanity to counter private monopolisation and/or state-controlled internet access.

INDICATORS OF SUCCESS	***THE BIGGER PICTURE***
• Planetary boundaries and meaningful connectivity are well understood within UN policy discussions. • Decision-makers understand the connection between planetary health, democracy, and meaningful connectivity.	Monopolisation of markets and dependency on big tech pose a big threat to democracies and the environment. This strategic pathway is inherently connected to the need for more open source technology and maintenance. It also considers new visions for economies more broadly, that acknowledge both the social foundation as well as planetary boundaries.

CONTEXT	***SOURCES AND FURTHER READING:***
UN Enable Alignment: Build Pioneering Coalitions 2030	• Doughnut Economics Action Lab • Doing the Doughnut Tech • BOLT Amplify (ISOC) • Starlink in the Amazon • Exploring Sustainability in Digital Tech • Connectivity and digital appropriation for climate resilience in rural areas



SYSTEMIC RISK ASSESSMENTS BASED ON MANDATED SUSTAINABILITY REPORTING

CODES leverages newly mandated sustainability reporting to help people discover and audit digital supply changes

BRIEF DESCRIPTION

Discovery of sustainability data continues to be a problem for conducting audits of digital supply chains and making risk and investment assessments about digital products and services. However, in the European Union and the US, changes in the law mean that lots of firms will need to publish all kinds of sustainability data that previously they didn't have to. The European law says they need to publish this data online, free of charge for the public to see, and there are significant fees for non-compliance.

New standards mean that this data will be comparable, machine-readable, and likely across different parts of the world. This could make verifying claims and identifying greenwashing easier, if it's done right.

One of the best examples of this is the Corporate Sustainability Reporting Directive (CSRD) passed in the European Union, otherwise known as the CSRD which will lead to ***unprecedented data about large corporations (about ¾ of the European Economic Area) and their environmental and societal impacts***, which for the first time will be published in formats that are comparable and standardized. However, it's not just in Europe that we are seeing this trend. In California, the largest economy in the United States, the Climate Corporate Data Accountability Act (the CCDAA) was written into law late last year, which in substance is similar to the European CSRD. At a national level in the United States, the Securities and Exchanges Commission (the SEC), has also mandated climate reporting. The SEC is the body that regulates what publicly traded companies in the USA must report each year, so this is a significant shift. Other jurisdictions will likely follow these moves.

There is an opportunity to ***make this sustainability information easier to discover***. We need predictable, consistent places on any website to publish sustainability data so that both humans and machines can find it. Data that organisations are legally required to disclose to the public should be easily accessible from a single domain lookup. Structuring this information using a file syntax enables search engines and other third-parties to crawl and consume it in their services. Possible beneficiaries of this data include any entity making procurement and know-your-customer decisions from government to the private sector, as well as financial investors wanting to ensure their portfolios meet certain sustainability criteria, as well as civil society advocating for transparency and accountability from corporate players.

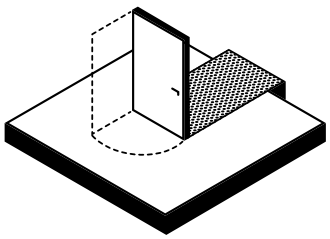
STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Advocate for the benefits of standardized sustainability reporting such as CSRD • Seed early-stage tooling that leverages this reporting data to solve sector-wide issues. • Advise other jurisdictions looking to pass similar laws so that the reporting covers metrics that are important to the work.	These laws are new and coming into force, including jail time for non-compliance. Companies are paying attention to this reporting. Machine-readable open solutions working at the scale of the web can achieve more reach and agility than the proposed centralized portal of the EU (see for example the shift from HTTP to HTTPS through certbot). If sustainability data is used properly, it will influence investment portfolios which will ultimately influence corporate actions.

POTENTIAL PARTNERS
Green Web Foundation with its carbon.txt project, EU Next Generation Internet, regulators and policymakers responsible for making sure the new laws – primarily CSRD – are followed, staff in companies with responsibility for complying with CSRD legislation, advisors to firms affected by legislation and reporting against the CSRD, specialists familiar with the rules for ESRS E1 – "Climate Change", civil society consumers of data published by the CSRD

POTENTIAL RISKS AND TRAJECTORIES
• To date, finance is the only sector able to afford these products, and even then, these financial services firms are on the record saying they mainly purchase these services because it is the only way to access the data. Open and public solutions could make this information available to more players and create space for innovation. • The data is published in a centralized portal and the value of connecting this information to other digital products and services is diminished. • Transparency alone does not lead to systemic change, so these disclosures need to be accompanied by other tactics.

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• This data complements existing reporting by adding new sources of information. • Search engines and other third-parties to crawl and integrate into their services. • Financial and investment decisions are made using this data	• These laws are only in place in the EU and US at the moment, although other jurisdictions are considering them. More adoption will be needed to have worldwide coverage.

CONTEXT	*SOURCES AND FURTHER READING:*
EU, multilateral institutions	• Introducing carbon.txt by the Green Web Foundation • What is the CSRD
Prevent Rights Violations	
Support governance breakthroughs	
2028	



UPDATE THE MULTISTAKEHOLDER APPROACH: INCREASING PARTICIPATION IN GLOBAL POLICY

Analyse and update multi-stakeholder formats to implement in upcoming global policy fora.

BRIEF DESCRIPTION

Multistakeholder governance is an approach that involves gathering various stakeholders to engage in dialogue, make decisions, and implement solutions for commonly recognized issues. The underlying principle is that incorporating diverse perspectives from all involved parties leads to decisions that are more legitimate and more effectively implemented compared to traditional state-based or Public Private Partnership approaches. For civil society organisations, multistakeholder governance is usually the most obvious, but far from perfect way forward in global governance, especially when compared to multilateralism and intergovernmental exchanges that centre countries and their official representing institutions.

The multistakeholder approach faces criticism, too: For those that generally welcome participation by a broader group of organisations and perspectives, the underlying question remains who in fact has the resources to participate meaningfully, as due to the sheer number of participants, multistakeholder formats can be time-consuming and expensive to follow. This can lead to companies and civil society organisations from the minority world being overrepresented, while civil society from the majority world struggle to join due to a lack of resources and visa regulations.

Others criticise the multistakeholder approach, as it is implemented today, as an inherently undemocratic approach that lacks a transparent selection process for stakeholders, does not address the inequality in the field, and allows for corporate interests taking a seat at the table [Gleckmann 2018]. Climate action researchers state that multistakeholder formats in the climate sector tend to be unambitious, lack clear objectives and monitoring, leading to a duplication of efforts.

Both benefits and criticisms apply for former and current multistakeholder formats for sustainability and digital policy in a global context, such as the 2003-2005 World Summit on the Information Society (WSIS) and following summits thereafter, the Internet Governance Forum (IGF), the European Dialogue on Internet Governance (EuroDIG) or the United Nations Climate Change Conferences (COP). The current state of multistakeholder governance provides several opportunities to strategically participate in these processes, but also to weigh in on how to improve them. The Global Digital Compact of 2024 contains several commitments that open up new ways for action, e.g. by "continued efforts to increase diverse participation from Governments and other stakeholders from developing countries" (GDC, 29 b). Apart from updating the Internet Governance Forum, the Global Digital Compact contains several new multistakeholder formats to be created in the next few years.

Supporting the establishment of innovative and future proof governance models can provide a strong position especially for global policy actors working on digital issues and sustainability, as both are cross-sectoral topics that are increasingly tied in with other debates and new policy fora. By making sure that these emerging intersections are open to the relevant audiences and have meaningful transparency and accountability, global policy actors can lay the groundwork to structurally include digital transformation and sustainability into these debates.

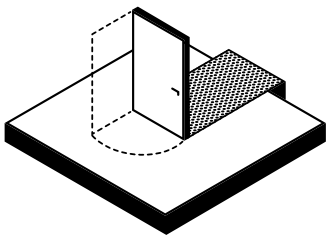
STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Track commitments for new multistakeholder processes, especially in the GDC, and advocate for implementing them • Collaborate with partner organisations to define clear goals and monitoring systems for these processes. • Propose selection criteria for multistakeholder processes that counterweigh global inequalities and make representation in these contexts more. • Advocate for allied governments to work with civil society in these processes, e.g. by providing travel stipends.	• Engage more diverse actors in the global policy field to ensure better representation in processes and outcomes • Bridge debates between sustainability and technology fora by shaping processes that work for both fields • Bridge the gap between (trans-)national efforts and global policy arenas by providing fora that produce meaningful outcomes in a transparent way.

POTENTIAL PARTNERS
• Potential partners are policy arenas employing a multistakeholder model that can be learned from such as REN21, a policy network and a multistakeholder governance group which is focused on renewable energy policy. From the technology field, MSP, the European Multi Stakeholder Platform on ICT Standardisation, provides an example on how to strategically pursue standardisation efforts.

POTENTIAL RISKS AND TRAJECTORIES
The IGF is discontinued and multistakeholder exchange is fundamentally curbed → In the short term, another relevant forum is the WSIS + 20 process and its follow-ups that would benefit from multistakeholder processes. In the long term, any potential successor to the 2030 agenda needs a strong multistakeholder approach to align the many sectors and meaningfully include digitization and sustainability as cross-sectoral topics.

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• Commitments for new multistakeholder processes, e.g. from the Global Digital Compact are implemented in a more democratic, more transparent way. • Civil society and academia are more aware and meaningfully included in multistakeholder processes on digital and sustainability topics. • Selection of stakeholders does no longer rely purely on resources and access, but is monitored according to a transparent assessment framework.	Multistakeholderism becomes more relevant in almost all global policy fields. Expertise and recommendations on how to implement it well will become more relevant and open doors into new policy arenas.

CONTEXT	*SOURCES AND FURTHER READING:*
UN, IGF, GDC digital governance bodies 2025+	• Common Minimum Standards for Multi-stakeholder Engagement in the UNDAF • Multistakeholderism: a critical look • Example of a multistakeholder model by INTERREG • Assessment methodology for multistakeholder coalitions



UNLOCK NEW POLICY FORA THROUGH NEXUS DIALOGUE FORMATS

Continuing the NEXUS Dialogues as a driver to tackle the triple planetary crisis and ensure a sustainable transformation

BRIEF DESCRIPTION

Bringing together relevant policy actors and unsiloing discourses is key for speeding up the just and sustainable digital transformation. The triangulation of policy actors and arenas can be one important instrument and the Nexus Dialogues a concrete format on how to bring such stakeholders together.

The Nexus Dialogue format was a result of the 2021 UN resolution 'Promoting sustainable consumption and production patterns for the implementation of the 2030 Agenda for Sustainable Development, building on Agenda 21" (A/RES/76/202) which sparked the new Global Strategy on Sustainable Consumption and Production. The UN Environment Management Group (EMG), UNEP and CODES among other UN entities started the EMG NEXUS Dialogues on Sustainable Consumption and Production (SCP) which is specifically aimed to help UN agencies jointly implement the SCP and SDG12.

So far, two NEXUS dialogues have taken place in 2023. The first NEXUS dialogue 'Digitalization for Circular Economy and Green Jobs for Youth' showcased dynamic discussions and innovative ideas focused on sustainable growth and job creation. Key topics included the role of digital technologies in advancing circularity, the need for skills development in green and digital economies, and ensuring inclusive opportunities for youth in response to global environmental challenges. The second NEXUS dialogue 'Sustainable living and aspirational consumption to address the triple planetary crisis and support the SDGs' focused on evidence-based best practices for sustainable living while also addressing coordination and cooperation to ensure sustainable living is attainable for consumers through policy making and education. It also highlighted the need to involve key actors (youth, women, indigenous groups) for social inclusion in sustainable living.

This format could be used and further developed to bring together different policy arenas and explore connection points, for instance with the OECD on trade, and digital, sustainable transformation, with UNESCO on culture and digital, sustainable transformation and so forth.

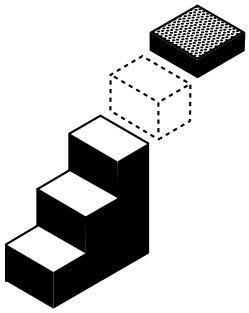
STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Involve most vulnerable communities and global majority governments in the next NEXUS dialogues to ensure faceted multi-stakeholder discussions • Expand NEXUS dialogue format to other policy arenas, in particular those lacking connections between sustainability and digital transformation approaches. • Host NEXUS dialogues with other relevant policy arena stakeholders (World Bank, ITC, UN Women, UNICEF)	• Sustainable economic and social transformation through digital transformation that is just • Digital technologies for sustainable production and consumption and circularity • Involvement of most important stakeholders

POTENTIAL PARTNERS
A number of different policy stakeholders could be relevant partners for implementing NEXUS dialogues in, for example: OECD - could be a partner in hosting a NEXUS dialogue on labour and circular economy related policy issues • UNESCO - could be a partner in hosting a NEXUS dialogue on culture and circular economy related policy issues • UN Women - could be a partner in hosting a NEXUS dialogue on gender and circular economy related policy issues

POTENTIAL RISKS AND TRAJECTORIES
The next NEXUS dialogues are not further developed to bring relevant actors together on different aspects of a just and sustainable digital transformation →The CODES community can become a driving force towards similar formats that bring different actors together

INDICATORS OF SUCCESS	***THE BIGGER PICTURE***
• Three new policy arenas connected through NEXUS dialogue formats • NEXUS dialogue become a multi-stakeholder format and a standard setting event for sustainable digital transformation as well as other relevant policy topics	Sustainable production and consumption are an essential component for a just and sustainable digital transformation. The NEXUS dialogues can play a role in promoting circularity, especially when it comes to digital technologies. They can also provide a space for raising awareness on sustainable production and consumption. This implementation pathway is connected to the implementation pathways 'CODES Post 2030' and 'Understanding the Relevance of Open Source for Sustainable Digital Technology'.

CONTEXT	***SOURCES AND FURTHER READING:***
labour rights	• EMG Nexus Dialogues on Sustainable Consumption and Production • Digitalization for Circular Economy and Green Jobs for Youth
OECD, UNESCO	
Build Pioneering Coalitions	
2030	



WORK ON A VISION FOR POST 2030

A Just and Sustainable Digital Transformation is at the Heart of a Post 2030 Governance Framework for Sustainable Development

BRIEF DESCRIPTION

Since 2015, the Sustainable Development Goals (SDGs) have been guiding governments, actors in the private sector, academia and civil society groups to attain sustainable development. However, the most recent progress report shows that there is still a long way to achieving the SDGs, despite efforts to accelerate them, such as through the Summit of the Future. Even after the SDGs are achieved, new challenges due to the climate crisis and geo-political events will most definitely arise. A post 2030 agenda must expand the SDGs to be able to address and tackle these new challenges. A post 2030 governance mechanism must ensure sustainability in the face of technological advances, adapt to demographic shifts, especially due to manmade and natural disasters, and redefine global cooperation in an increasingly complex and interconnected world. It needs to be flexible, forward-looking and inclusive.

Furthermore, the SDG Framework has been critiqued on its insufficient focus on systemic change and challenging the status quo, when it comes to, for instance, environmental degradation, capitalism, postcolonial power structures and power imbalances. The framework has also been criticized for not including indigenous knowledge. Furthermore, according to the 2024 progress report many global majority countries are falling behind in the achievement of the SDGs. This is in part due to the lack of representation in global decision-making, but also due to a failure to correctly address and shape decisions according to the needs of those countries. A just and sustainable digital transformation that leads to sustainable development cannot be realized without addressing these issues from an intersectional feminist perspective.

In the post 2030 era, the SDG Framework will have to be assessed and redefined. In becoming one of the leading champions for a post 2030 agenda, CODES can drive this redefinition. So far, the conversation around sustainable development in relation to digitalization has seen digital technologies solely as a means to achieve the SDGs without accounting for the negative impacts imposed by digital technologies on environmental sustainability as well as the wider social issues deepend or created by the digital transformation. CODES and CODES co-champions are working towards the alignment of the visions of the digital age with sustainable development and this work must provide the basis for a post 2030 governance framework. Actors working on sustainable development should seize the opportunity to reshape the conversation towards a just and sustainable digital transformation that is essential for sustainable development. This would grant more focus on issues such as advocating for a socially just circular economy, advancing digital public goods and fostering a more equitable and inclusive digital society that would be carried on even after 2030. A post 2030 governance framework will be one to break silos and think intersectionally.

STRATEGIC ACTIONS FOR CODES	*IMPACT*
• Start to foster multi-stakeholder collaboration to actively shape the post 2030 era, with a focus on a just and sustainable digital transformation and further the alignment of digital environmental sustainability in the sustainable development context, connecting actors and arenas working in different policy fields where the goal of a just and sustainable digital transformation is still missing or where it needs to be strengthened • Center voices from global majority countries, indigenous climate groups & grassroots organizations to ensure a that a just and sustainable digital transformation is at the core of the next era of sustainable development • Promote the integration of culture in the pursuit of sustainable development post 2030 • Plug into the EU's digital infrastructure agenda, especially on sustainable infrastructure, cybersecurity and ethical digital transformation as well as global data governance • Publish a CODES post 2030 strategic plan with concrete actions and a reassessment of the SDGs in terms of a just and sustainable digital transformation	A new agenda 2050 is created towards sustainable development that goes beyond tech solutionism and ensures a sustainable digital transformation that is just for the planet and the people along the lines of Shift 1. This agenda will ensure the sustainable design of digital innovation (Shift 3) as well as its use to achieve bigger goals such as environmental sustainability, reduction of poverty and promotion of human dignity and peace. Moreover, this agenda will be focused on the needs of the most affected peoples and areas (MAPA).

POTENTIAL PARTNERS

In order for a just and sustainable digital transformation to happen successfully and lead to sustainable development, a multitude of actors and actor types must be involved, these could include:

- Civil society organizations, grassroots movements and indigenous networks; such as Climate Action Network (CAN) or Indigenous Environmental Network and Digital Rights Groups; such as Access Now
- Multilateral development institutions, such as the African Development Bank and the World Bank
- Private Sector; such as Google and Microsoft and World Business Council for Sustainable Development
- International Organizations; such as UNICEF and UNESCO

CODES must be a leading force with international organizations and institutions where the synergy of environmental sustainability and digital transformation is not yet acknowledged.

POTENTIAL RISKS AND TRAJECTORIES

Without sufficient coordination, the risk of fragmentation of efforts runs high when it comes to the post 2030 era leading to a weaker impact. International actors must strengthen alliances and coalitions with potential partners in order to ensure the alignment of visions of the digital age with sustainable development.

There is also a risk of the continuous marginalization of those whose voices are most unheard. Therefore, the engagement of grassroots movements working on the ground to become co-leads in the post 2030 era must be ensured. By mitigating those risks and starting early to prepare for the post 2030 era, CODES and other international actors and arenas will be able to shape global digital governance to have wider reach and more powerful impact towards a just and sustainable digital transformation that ultimately leads to sustainable development.

A post 2030 governance framework for sustainable development should build on the SDGs and define the necessary conditions for international actors as well as governments to align the sustainable development agenda with the rapid digital transformation focusing on a just transition.

INDICATORS OF SUCCESS	*THE BIGGER PICTURE*
• A just and sustainable digital transformation becomes a focal point in a post 2030 sustainable development governance framework • International actors where alignment still needs to be such as the Asian Development Bank, Consumers International and the World Trade Organization (see Annex) • Grassroots movements and indigenous networks join the CODES network • CODES becomes THE voice for a just and sustainable digital transformation in the post 2030 era • The SDGs' successor framework is redefined and shaped according to the challenges faced and needs of the most vulnerable	A post 2030 sustainable development framework must be equitable and inclusive. It learns from its predecessors (the MDGs and the SDGs) and challenges the status quo and tackles power imbalances and promotes a world order based on postcolonial political relations instead of accepting them. This implementation pathway is directly connected with implementation pathways 'Learning and transferring governance formats: The multistakeholder approach', and Explore connections between Climate Action Hub Networks in order to connect and scale their efforts ' as they can have direct influence on CODES' work which feeds into the post 2030 era.

CONTEXT	*SOURCES AND FURTHER READING:*
UN	• Times of Crisis, Times of Change. Science for Accelerating Transformations to Sustainable Development. • The Sustainable Development Goals Report 2024
global majority and indigenous experts and movements	
Connect Communities and Transformations	
2030	

REFLECTIONS ON COMMON THEMES AND CALL TO ACTION

There are common themes that connect many of the implementation pathways. Some of the implementation pathways highlight the dynamics between sustainability, innovation, care and maintenance, as well as the relevance of Open Source, locally developed and adaptable technologies. These pathways offer new narratives and approaches led by actors around the globe actively working on a just and sustainable digital transition. However, in many policy arenas the dominant role of industry and industry funding heavily influences digital transformation and sustainability narratives. In particular during the hype phase of AI, the narratives provided by the larger technology companies regarding sustainability need to be questioned by critical, expert voices. These power dynamics and resulting challenges are also addressed by many of the implementation pathways. They offer ideas on how CODES can bring a more grounded public interest perspective and amplify those actors developing alternative digital futures, in order to help provide a much needed counterweight to the industry narratives. The CODES community can play a key role in emphasizing that the key challenges are not technical, but rather socio-political and help set new standards. For instance, ensuring that a power analysis is part of any assessment of the digital sustainability of a project, questioning who is in control, who benefits and who could be harmed?

There are many opportunities in connecting with civil society and grassroot initiatives working on a just and sustainable digital transition, in particular actors working on open and sustainable technologies and policies, such as the Right to Repair community. Several discourses can be connected that are currently taking place in separate communities - for example, “quality of connection” and “meaningful connectivity” are shared goals of actors working in development projects on electrification and those aiming to bridge the digital divide. Connecting these actors on a practical, as well as a policy level can enable new quality concepts and innovative approaches. The CODES community can play a role in elevating civil society actors’ voices in relevant policy arenas.

A diversity of actors is needed to ensure the efforts towards a just and sustainable digital transformation for people and the planet are rooted in the societies affected by them. This is a prerequisite for the successful wider adoption of new policies, changing cultures of consumption and economics of production. All the implementation pathways highlight the need of cross-sectoral and multi-stakeholder collaboration to ensure the development of more innovative policy approaches, as well as to ensure their widespread adoption and implementation.

There is so much that can be done in order to advance a just and sustainable digital transformation for people and the planet. Aligning key policy arenas and connecting relevant stakeholders and their discourses is paramount. So much so, that the scope of activity is too vast for the CODES community to address on their own. We hope the lists of possible actions and possible partners included in each implementation pathway will inspire future collaborations and partnerships. While each pathway lists potential partners, we invite all interested actors to connect and become involved.