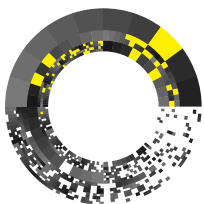
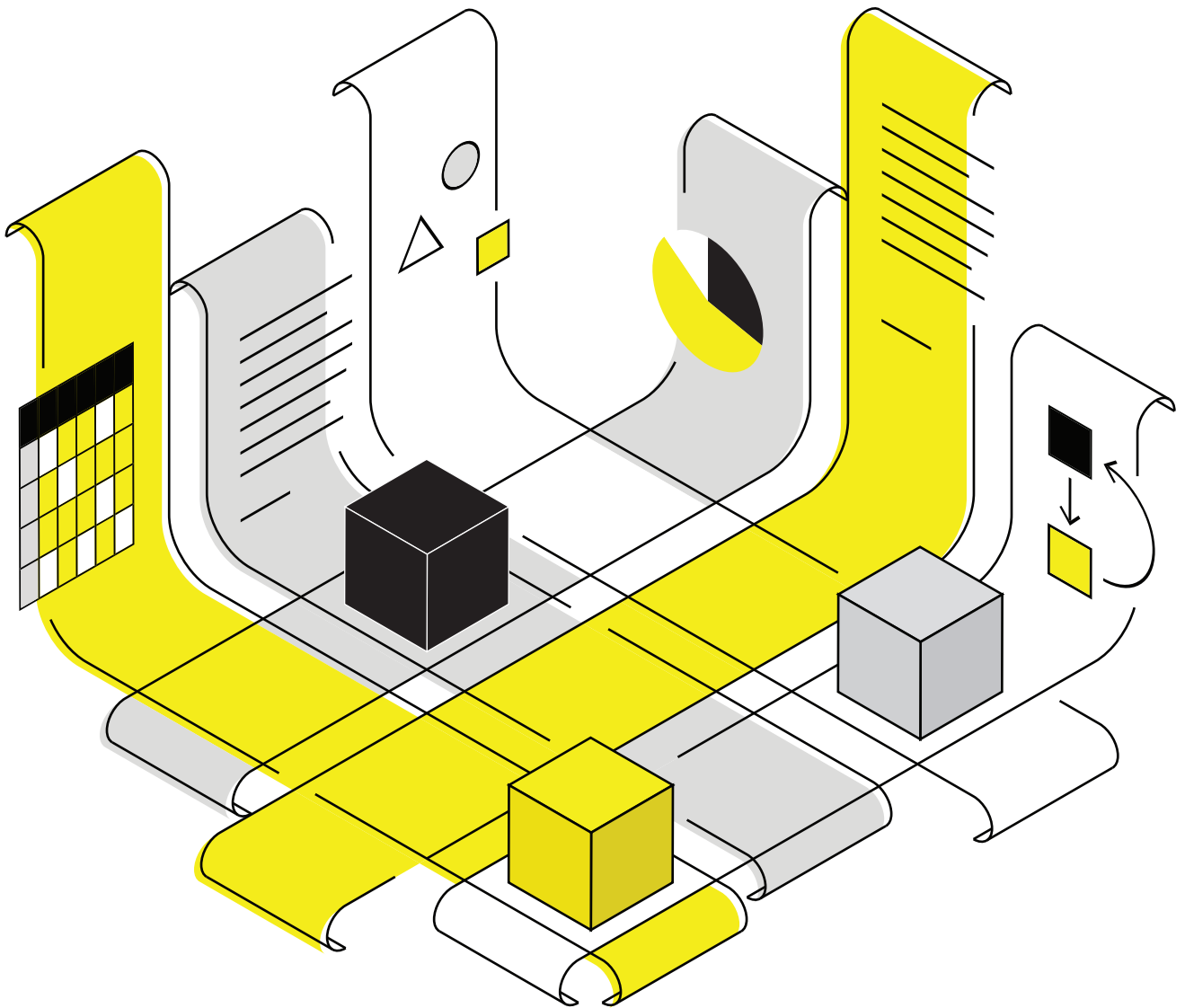
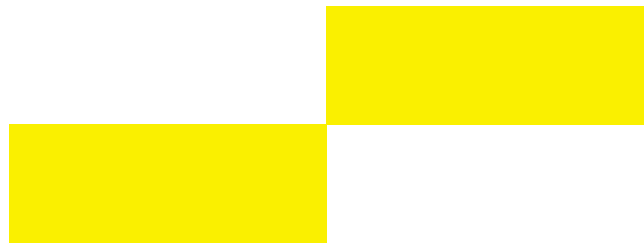


**THE PARADOX OF OPEN:**

# **POLICIES FOR THE DIGITAL COMMONS**



**OPEN  
\_FUTURE**



# \_INTRODUCTION

*The development of Digital Commons is one of the greatest achievements of the digital transformation of the last 25 years. New forms of collaboration and sharing enabled by the internet have given rise to digital resources that are created and managed by communities that share them openly according to established rules, the open source software industry, open-access research in the European Research Area, Wikipedia, and open government data being prime examples.*

*Over the same period of time, Europe faced the challenge of the growing power of commercial platforms that dominate the internet today. The initial vision of an open, non-commercial internet has been replaced by a digital domain divided into closed communication networks controlled by commercial actors. The original, interoperable internet still functions as a basic communication layer. Yet commercial networks built on top of it made users dependent on their proprietary systems and solutions. The story of their growth is also a story of extracting value from publicly available information and data produced by users.*

Large AI models developed by commercial entities that are trained by scraping the publicly available internet and benefit from resources such as Wikipedia are the latest iteration of the enclosure of the Digital Commons. This is [the Paradox of Open](#): while openness offers the strongest counterbalance to the corporate enclosure of information and culture, it is also vulnerable to exploitation and can even serve as an enabler of the concentration of power.

Over the last five years, the European Commission has redefined its approach to the Digital Single Market by introducing policies that focus on safeguarding fundamental rights and European values. Symptomatically, the flagship initiatives of the Commission's current digital policy package – the Digital Services Act and the Digital Markets Act – regulate dominant platforms to protect fundamental rights, create a safer digital space, and increase competition in digital markets. These regulations address the above paradox by reducing forms of exploitation, making commercial platforms more accountable for the systemic risks they create, and forcing at least a limited opening up of their services and resources.

In parallel, the policies and regulations that give life to Europe's new data strategy are based on a vision of data governance that balances the protection of rights with the flow and reuse of data. New regulatory mechanisms create new opportunities for data sharing, and Europe hopes to create open and interoperable data spaces.

In other words, these policies create an opportunity to build an internet that is not only a commercial marketplace but also a [Digital Public Space](#). This ambition has been recognized in the European Union's Declaration on Digital Rights and Principles for the Digital Decade, which includes participation in the digital public sphere as one of its key principles. This is an important declaration that paves the way for new policies to ensure that digital technologies enable a just and democratic society. Where fundamental freedoms and rights are protected, strong public institutions work in the public interest, and where people have a say in how services they depend on work.

We believe that in the coming years, Europe will have the opportunity to shape such a digital society. Building on the foundations set by this Commission's regulation of commercial platforms, the next digital policy package needs to focus on strengthening different forms of Digital Commons and protecting them from exploitation. As input for the digital policy agenda for the second part of Europe's Digital Decade, we are offering seven suggestions for policy interventions in support of the Digital Commons:

**A DIGITAL KNOWLEDGE ACT FOR EUROPE**

*Empowering knowledge institutions in the digital environment.*

**A COPYRIGHT INFRASTRUCTURE FOR THE DIGITAL AGE**

*Building standards for making copyright information discoverable.*

**A PUBLIC OPTION FOR AI DEVELOPMENT**

*Ensuring more equitable access to training data and compute.*

**A EUROPEAN PUBLIC DIGITAL INFRASTRUCTURE FUND**

*Investing into the foundations of Europe's Digital Public Space.*

**A PUBLIC, INTEROPERABLE SOCIAL MEDIA SPACE**

*Reducing the dependency on commercial social media platforms.*

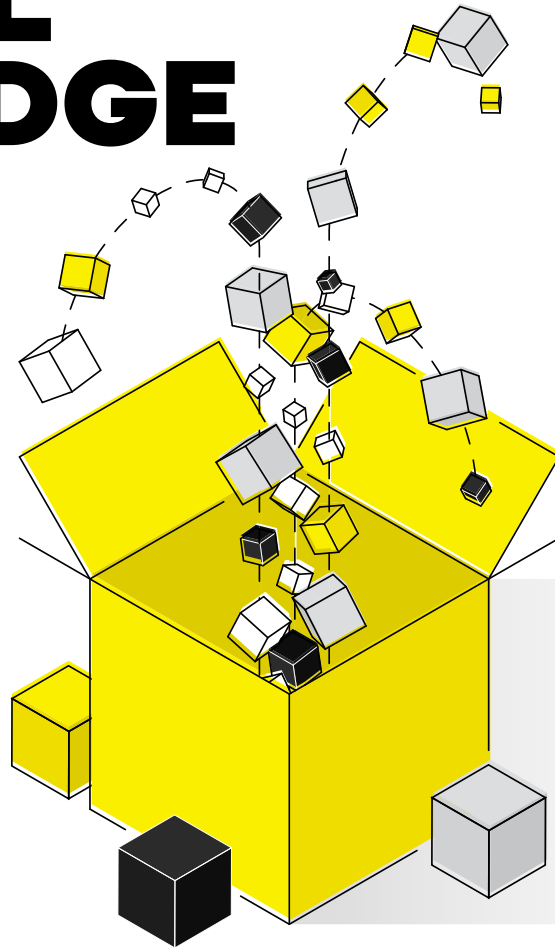
**A COMPREHENSIVE ICT ENERGY SUSTAINABILITY POLICY**

*Ensuring a greener and more sustainable digital landscape for Europe.*

**A PUBLIC INFRASTRUCTURE FOR OPEN ACCESS**

*Advancing equitable access to scholarly communications.*

# — A DIGITAL KNOWLEDGE ACT FOR EUROPE



**KNOWLEDGE INSTITUTIONS** – such as education, research, and cultural heritage institutions – are one of the pillars of the Digital Commons. They play a crucial role in connecting European citizens to information resources and enabling them to use them, thus contributing to an environment conducive to innovation and the creation of new knowledge. But as we approach the halfway point of [Europe's Digital Decade](#), these institutions still cannot offer the same services online as offline – a fact that reinforces the dominant position of commercial entities as information intermediaries in the digital domain.

And while the European Union (EU) spends massive amounts on research and innovation, it has failed to prioritize key reforms that would enable universities to create and better disseminate knowledge and technologies. Academic researchers are too often prevented from sharing digital research resources with colleagues, which hampers research transparency and collaboration across borders.

In addition, much of the published research funded with public money through [Horizon Europe](#) or other public sources ends up behind paywalls, imposing a huge financial burden on other research institutions that need to access it.

Even where the law allows knowledge institutions to access or share certain materials, they are often reluctant to do so for fear of being sued. In the United States, public interest institutions are protected from paying damages if they act in good faith and believe that their actions are permitted by law. In Europe, the lack of such protections, combined with a highly complex and fragmented copyright framework, has a chilling effect on the exercise of users' rights.

Educational and cultural heritage institutions also face significant barriers when trying to make learning materials available in digital form. Although more and more learning takes place online, knowledge institutions cannot acquire e-books on the same terms as physical books.

To make matters worse, many scholarly publishers and other software vendors for knowledge institutions have transformed their business models into data analytics companies. By offering one-size-fits-all solutions for the entire research workflow, these companies aim not only to lock knowledge institutions into a single system but also to create new dependencies that further entrench the dominance of commercial players in the digital domain.

## **\_WHAT NEEDS TO BE DONE?**

These problems need to be addressed by legislation at the EU level. So far, most regulatory interventions in the digital domain have either ignored the needs of knowledge institutions or, at best, exempted them from the effects of regulation aimed at other actors – often only after considerable advocacy efforts.

As [also pointed out by the COMMUNIA](#) association, it is time for a legislative intervention specifically designed to empower knowledge institutions to fulfill their public service mission in the digital environment: A Digital Knowledge Act. Such an act should include some surgical interventions in copyright law, such as a legal solution for library e-lending, but mostly measures that go beyond previous copyright discussions.

### **SUCH A DIGITAL KNOWLEDGE ACT SHOULD ADDRESS FIVE ISSUES:**

**\_FIRST**, it must enable knowledge institutions, researchers, and educators to enjoy an enabling legal environment in which to carry out their public service mission; this right should extend to joint cross-border activities, ensuring that knowledge institutions, researchers, and educators can collaborate with institutions and colleagues from other countries. The law should also address the issue of adaptation to the digital environment by asserting the right of knowledge

institutions to use protected material in digital formats under at least the same conditions as in physical form.

**\_SECOND**, the Act should ensure that access to publicly funded research and public sector materials is facilitated. Publicly-funded research is often unavailable due to copyright restrictions, creating a barrier to scientific progress and depriving the public of knowledge. To strengthen the EU's commitment to [Open Access](#), a harmonized secondary publication right should be introduced to allow the re-publication of publicly funded research and make it accessible to the public (see also "[A Public Infrastructure for Open Access](#)").

**\_THIRD**, the law should include provisions to protect knowledge institutions from liability where they act in good faith and believe their actions are permitted by law. The complexity of copyright law in Europe and the risk-averse culture of many public institutions means that knowledge institutions are reluctant to make full use of their rights under exceptions and limitations in order to minimize legal risk.

**\_FOURTH**, the Act should further protect knowledge institutions from abusive contracts and refusals to license. Given the public interest mission of knowledge institutions, rightholders should be required to license works to them on reasonable terms.

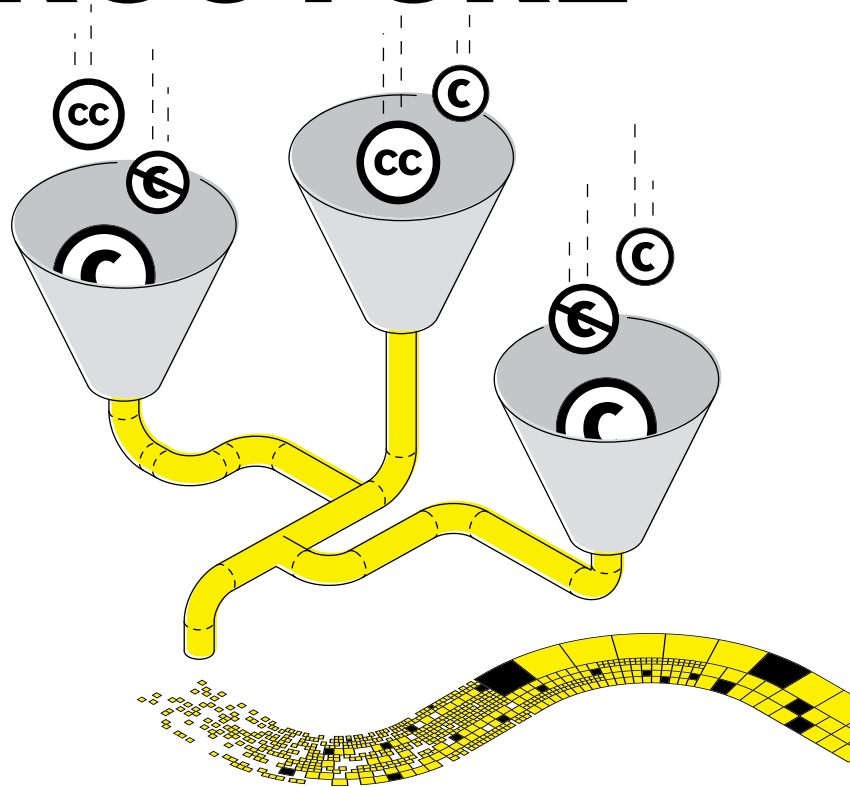
**\_FINALLY**, knowledge institutions should be allowed to circumvent technological protection measures where locks prevent legitimate access and uses of works, such as uses covered by exceptions and limitations to copyright.

Taken together, these measures would significantly strengthen the position of knowledge institutions in the digital field and ensure that they can be a strong anchor for the European Digital Public Space.

## **\_EUROPE'S OPPORTUNITY**

Many elements contained in the above proposal can build on a number of preparatory studies and processes undertaken by the European Commission services during the current mandate and can count on broad support from organizations representing knowledge institutions from across the EU. The new European Commission should make a Digital Knowledge Act a key element of its digital strategy for the second half of the Digital Decade and commit to presenting a proposal for regulation as early as possible in the next mandate.

# — A COPYRIGHT INFRASTRUCTURE FOR THE DIGITAL AGE



**FIVE YEARS AFTER ADOPTING** the [2019 Copyright Directive](#), discussions about copyright are back in the spotlight. The sudden emergence of generative AI systems trained on billions of copyrighted works has created a lot of uncertainty among creators and other rightholders and raised new questions about how copyright interacts with this new set of technologies.

Fortunately, the EU copyright system is well-equipped to deal with these challenges: The 2019 directive introduced two exceptions for text and data mining that [provide a balanced framework for using copyrighted works when training generative AI systems](#). Researchers in academic research institutions and cultural heritage institutions are free to use all lawfully accessible works to train AI models for the purpose of their research. Everyone else – including commercial AI developers – can only use works that are lawfully accessible and whose rightholders have not explicitly reserved their use for text and data mining.

The result is a balanced legal framework that privileges uses of works in the public interest but allows those creators and rightholders to control if and how their works can be used for AI training in other contexts. At the same time, this opt-out approach ensures that the vast majority of copyrighted material that is not actively managed by its creators or other rightholders can be freely used to train AI models.

The AI Act, once enacted, will build on this approach by requiring AI model developers to implement policies to comply with creator and rightsholder opt-outs and provide transparency about their use of copyrighted works for model training.

What is currently missing to make all of this work in practice is a set of generally accepted technical standards for expressing and managing such opt-outs and copyright information more generally. The lack of publicly available, reliable information about the copyright status of works and the permissions granted or reserved by creators and other rights holders is increasingly hampering the ability of copyright to function in machine-to-machine contexts. It also risks undermining the viability of Europe's balanced approach to dealing with the copyright issues raised by generative AI.

## **WHAT NEEDS TO BE DONE?**

This means that during the next mandate the EU should focus on creating the conditions for the existing copyright framework to work by investing into and supporting the creation of a copyright infrastructure that ensures that the copyright framework remains fit for purpose.

Increasing the amount of publicly available information on the copyright status, the usage permissions granted or reserved by creators and other rightholders is an essential step toward making sure that the EU copyright rules for generative AI training will work in practice and enable creators and other rightholders to control the conditions under which their works can be used. Increasing the amount of publicly available information is also an essential ingredient for protecting Public Domain works and other parts of the Digital Commons (such as works available under open licences).

So far, EU involvement in this space has been limited. To ensure that the EU regulatory framework for the use of copyrighted works functions in practice, the EU needs to step forward and ensure that the required technological infrastructure exists and that it is provided as a public good that serves the interests of all stakeholders: creators, rightholders, technology companies, and users (including institutional users).

Such an infrastructure must also be able to serve as a registry of Public Domain and openly licensed works that constitute the Digital Commons and must be protected from re-appropriation. Providing reliable public information on the copyright status and the licensing conditions is an essential step in removing legal uncertainties around the re-use of these works and further unlocking the societal



value of the Digital Commons through initiatives like the [Common European Data Space for Cultural Heritage](#). Ultimately, addressing the discoverability issues of copyright in the digital domain should benefit all stakeholders, including creators and other rightholders.

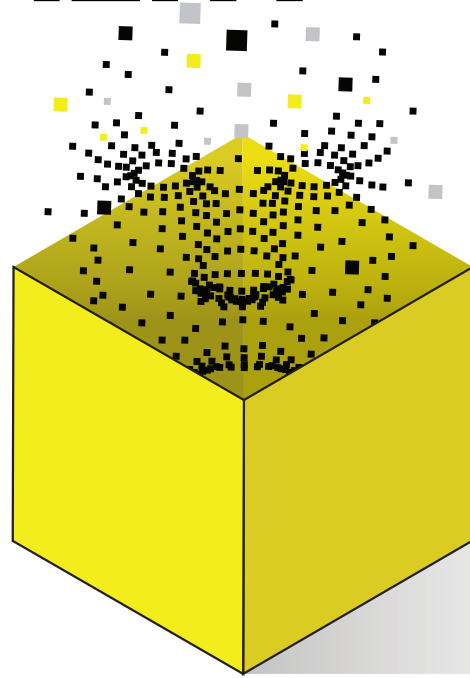
## **EUROPE'S OPPORTUNITY**

As we have argued in our policy brief on the issue, the speed of development of generative AI systems means a clear and urgent need for the European Commission to provide guidance on how the machine-readable opt-outs from AI training should be expressed in practice.

For the next mandate, the Commission should commit to supporting the creation of standards and protocols for AI model training compliance to assist the proper functioning of the regulatory framework provided by the 2019 Copyright Directive and the AI Act. These standards should complement (and possibly build on) existing plans for a public repository of Public Domain and openly licensed works.

To ensure that the EU copyright framework contributes to the broader goal of maintaining a balanced, transparent, and fair digital ecosystem, the Commission should also conduct a feasibility study for a more comprehensive copyright infrastructure that builds on these elements and identifies other areas of intervention needed. Based on the outcomes of such a study, the Commission should publish a roadmap for its implementation.

# — A PUBLIC OPTION FOR AI DEVELOPMENT



**THE EUROPEAN UNION** (EU) is at the forefront of regulatory efforts to limit the dominance of large technology companies, as evidenced by the [Digital Services Act](#), the [Digital Markets Act](#), and the [proposed AI Act](#). While such regulatory interventions are undoubtedly important to address power imbalances and protect people from technological harm, true democratization of AI development will require a more comprehensive approach to technology governance.

Experts agree [that artificial intelligence is the next frontier of market concentration in the landscape of the internet economy](#). As AI applications continue to reshape industries and society, the current trajectory reveals a critical bottleneck in the form of reliance on private infrastructure.

Large technology companies, many of which have been targeted by the EU regulations listed above, have disproportionate control over resources critical to AI development. These resources include computing power, data storage capabilities, data sets, and products and services into which AI can be integrated. This dominance contributes to a landscape where access is limited, benefits accrue to a select few, and the shaping of the technology is primarily driven by corporate interests. In this situation, society acts merely as a consumer of technologies and services that are often designed without regard to its best interests.

This reliance on private infrastructure is a significant barrier to the democratization of AI. Breaking away from this dependency on Big Tech is critical to ensuring Europe's digital sovereignty and fostering a more inclusive and diverse AI landscape.

## WHAT NEEDS TO BE DONE?

To tackle these issues, the EU must make strategic investments in the resources and technologies needed to develop AI. These investments should aim not only to reduce current market concentration but also to enable a broader range of actors to contribute to and benefit from advances in AI technology. The goal should be to empower these diverse stakeholders to shape the future trajectory of AI development, ensuring that AI not only does not harm society but also meets societal needs and its benefits are widely shared. Aligning AI advances with broader goals of social progress and sustainability requires public investment in this technology rather than leaving its fate in the hands of private companies.

The European Commission has responded to this challenge and outlined its ambitions in the [AI Innovation Package to support Artificial Intelligence startups and SMEs](#) presented in January 2024. The interventions and support actions outlined in the [Communication on EU AI Start-Up and Innovation](#), which is part of the Package, address three key bottlenecks: data, computing capacity, and talent. The Commission promises additional investment in computing capacity through the creation of "AI factories," building on the existing [EuroHPC supercomputing facilities](#), and mobilizing support for start-ups working on generative AI through the Horizon Europe program. However, to achieve the goal of reducing dependency on large technology companies, support for the startup ecosystem is not enough, as the exit strategy for many of these startups continues to be acquired by Big Tech. To deal with this challenge, the EU's efforts [must focus on support for independent open source AI research and the development of large-scale artificial intelligence models designed to address pressing societal challenges](#).

The AI Innovation Communication identifies a number of key initiatives, such as the creation of an [Alliance for Language Technologies European Digital Infrastructure Consortium](#) and a commitment from the European institutions to provide language resources. These initiatives should be implemented in the form of datasets governed as Digital Commons, meaning that they should be shared in the public interest, with democratic and collective oversight. It will also be important to develop mechanisms that ensure a fair "give back" to the creators, rights holders, and communities involved in the creation of these resources.

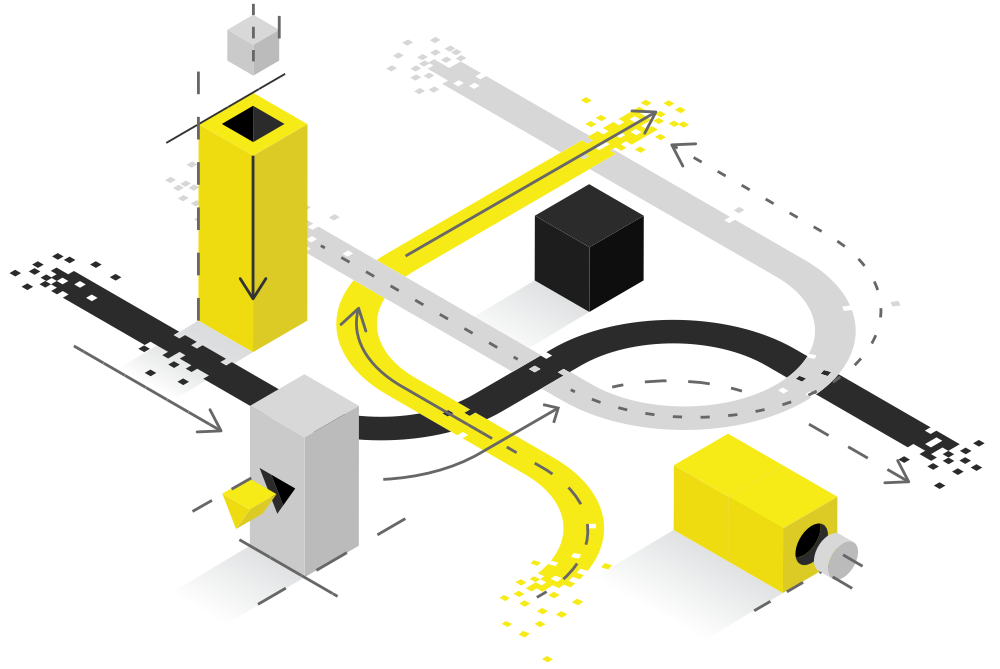
To handle the data bottleneck, the EU should support the creation of trusted, commons-based datasets for AI. The relative scarcity of openly available training datasets currently makes it difficult for independent open source AI developers to compete with Big Tech, which often has access to vast amounts of proprietary data in addition to data scraped from the public internet.

## **EUROPE'S OPPORTUNITY**

Building on the initiatives outlined in the [AI Innovation Package](#), the next European Commission should focus on building commons-based data sets that can be used for training large-scale artificial intelligence models designed to address pressing societal challenges. This work should leverage the [Common European Cultural Heritage Data Space](#) and focus on ensuring that Europe's rich linguistic and cultural heritage can feed into the development of open source AI models.

A first step in this direction would be to open up the vast collections of digitized public domain books held by libraries across the EU, which have been digitized as part of the Google Books project (and are currently exclusively available to Google to train its AI systems). However, the ambition needs to go further and explore ways to make more recent (in copyright) works accessible while at the same time creating revenue streams from commercial users of such data sets to support their maintenance and ensure compensation to participating rightholders.

# — A EUROPEAN PUBLIC DIGITAL INFRASTRUCTURE FUND



**OVER THE PAST FIVE YEARS**, the European Union (EU) has enacted an ambitious set of digital policies aimed at upholding democratic values and individual rights. This includes the [Digital Services Act](#), the [Digital Markets Act](#), the [Data Act](#), the [Data Governance Act](#), and the proposed AI Act. These regulatory efforts to improve the digital space are an important step toward safeguarding the digital values and sovereignty that Europe aspires to.

These values and goals were set out in the [European Declaration on Digital Rights and Principles for the Digital Decade](#) that has been adopted by the European Parliament, the Council, and the European Commission at the end of 2022. The declaration includes the recognition of the importance of broad “participation in the digital public space” and calls for “promoting interoperability, transparency, open technologies and standards as a way to further strengthen trust in technology as well as consumers’ ability to make autonomous and informed choices.”

As Europe enters the second half of the [Digital Decade](#), it is important to recognize that these goals cannot be achieved through regulation alone. Building digital public spaces as alternatives to the existing commercial platforms dominating today’s online environment requires investment in the Public Digital Infrastructure that would enable these spaces to operate.

Building that infrastructure requires public investment. Only by investing public money can we ensure that public digital infrastructures are optimized for societal value rather than economic return and break with the logic of extracting economic value from all interactions in the digital sphere.

If Europe is to reap the full benefits of the regulation adopted during the current mandate, digital policy-making during the next mandate must focus on investment in the [Public Digital Infrastructure](#).

## **WHAT NEEDS TO BE DONE?**

Building this Public Digital Infrastructure requires investment. This is why the EU needs to work toward the creation of a European Public Digital Infrastructure Fund. As we have outlined in our [White Paper on a European Public Digital Infrastructure Fund](#), there is a clear need for a fund that can operate at the EU level and on a sufficient scale to support a Public Digital Infrastructure that can act as a viable alternative to existing services.

The overall objective of this fund must be to support the emergence and maintenance of digital public spaces in Europe by investing in the creation and maintenance of public digital infrastructures. The creation of such a European Public Digital Infrastructure Fund should build on – and extend – a number of existing initiatives, such as the [Next Generation Internet](#) initiative funded under the Horizon Europe program, the [Sovereign Tech Fund](#) initiated by the German government, and the [French government-led effort to support infrastructures for the Digital Commons](#).

In order to achieve its objective, the Fund would need to operate on a much larger scale (€100 million+ on an annual basis) than existing initiatives and have a strong focus on investing in the creation and ongoing maintenance of services and platforms that enable connection and exchange between users (both individual and institutional). This must include communication services and platforms, storage and computing services, identity services, and their underlying software functionality, protocols, and standards.

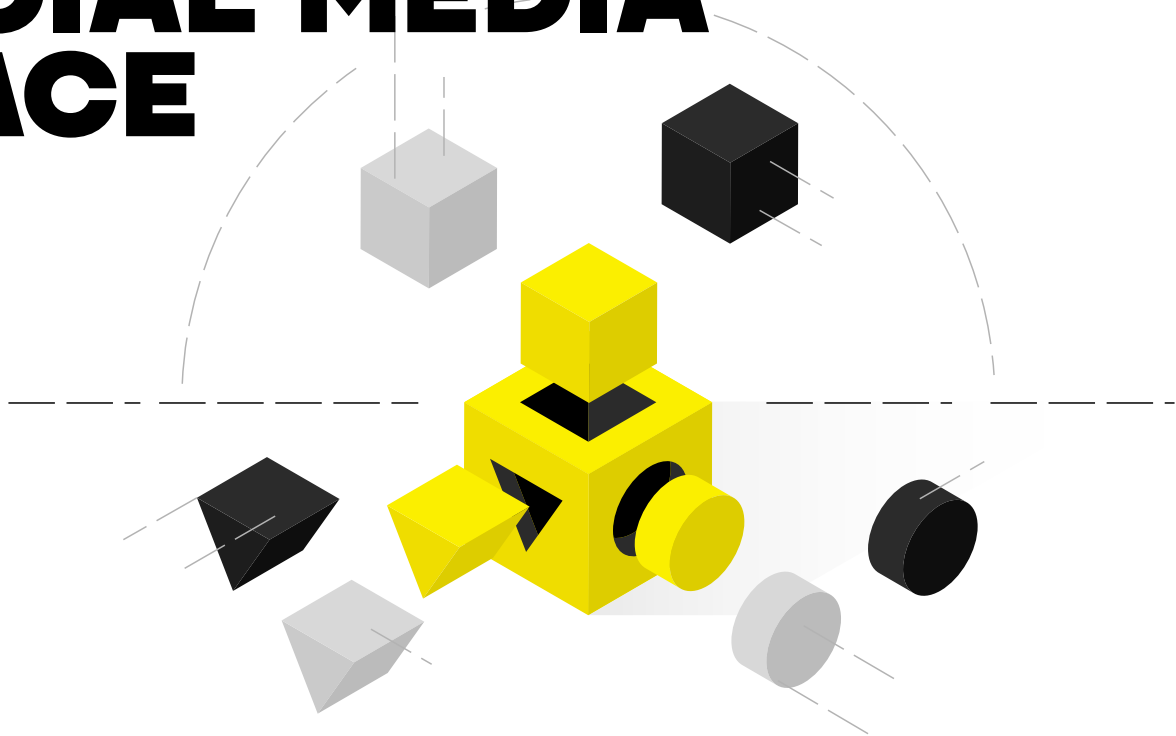
A key criterion for support from the fund must be that all services and tools are developed as free and open source software and implement open standards. The fund should enable public institutions, civil initiatives, and private entities (especially SMEs) to build and maintain public infrastructures that contribute to a more diverse and resilient European software development ecosystem.

# EUROPE'S OPPORTUNITY

The establishment of a European Public Digital Infrastructure Fund must be a key element of the next European Commission's policy agenda. The aim must be to make funding for the Public Digital Infrastructure an integral part of the next multiannual financial framework to be adopted in the middle of the next mandate.

In the meantime, the European Union and Member States should work together to scale up and combine existing efforts in this area and to mobilize additional funding. This should take the form of a [European Digital Infrastructure Consortium](#), bringing together the Commission and Member States willing to invest in the Public Digital Infrastructure, which can serve as a precursor to a more permanent implementation of the fund.

# — A PUBLIC, INTEROPERABLE SOCIAL MEDIA SPACE



**THE DRAMATIC INCREASE IN THE POWER** of commercial online platforms has been one of the main outcomes of the digital transition so far. The internet is dominated by a few platforms that have, over the years, gained a monopolistic position over online ecosystems. [Platformization](#) has upended the vision of a neutral and open internet.

The modern internet consists largely of closed, private communication spaces under corporate control. Platforms are the gatekeepers of content, communications, and data flows. This challenge is often framed in economic terms as affecting competition and innovation among business users and choice for end users. It also has negative societal effects, leading to social polarization, the spread of misinformation, censorship, or the growth of social inequalities.

During the current mandate, the European Union (EU) has enacted laws – the [Digital Services Act](#) (DSA) and the [Digital Markets Act](#) (DMA) – that build a platform regulation regime and aim to curb the power of the gatekeepers. They are intended to create a safer digital space by regulating platforms and to bring greater fairness to digital markets by enabling competition. But even as these regulations are starting to be applied, digital markets are becoming more centralized: new AI systems and services are primarily built by Big Tech companies, creating new opportunities for them to consolidate power in communication networks.



At the same time, a few dominant platforms, such as the service formerly known as Twitter, become increasingly pathologic, having adverse effects on the European public sphere. The reliance of the European public sector on these communication networks and the third parties that operate them is especially problematic.

## WHAT NEEDS TO BE DONE?

As we have shown, interoperability is a design principle at the heart of the original vision for the open internet. In technical terms, the principle means the ability of one service to connect to another so that data and content can flow freely.

In the platformized internet, gatekeepers reap the benefits of the interoperable internet without being required to make their own services or data interoperable. That's why interoperability mandates for gatekeeper platforms have great promise. They can open up platforms and ensure open communication flows through them in a way that supports both market competition and the democratization of power that these platforms now hold.

The DMA introduces two forms of interoperability requirements: one for messaging services and another that ensures third-party access to mobile devices and their operating systems. These requirements go into effect in March 2024. An evaluation of the Act, scheduled for 2026, can expand the interoperability provisions.

Interoperability is the foundation of alternative, decentralized digital ecosystems built around open standards. The most popular of these, the Fediverse, is a network of social networks connected by the ActivityPub protocol. The Fediverse has seen steady growth in recent years, triggered by crises faced by commercial gatekeepers, most notably the ongoing demise of the platform formerly known as Twitter. This demonstrates the generative nature of interoperability: the principle helps ensure that digital ecosystems are healthy and equitable and that online power is distributed in a way that avoids enclosures of the Digital Commons.

In a notable step, Meta has recently launched its new social networking app Threads in Europe. At this stage, Meta provides interoperability with the Fediverse. Once full interoperability is achieved, the ActivityPub protocol will support an ecosystem where information flows can flow freely between massive commercial networks and their decentralized alternatives.

A decentralized system of social networks built around the ActivityPub protocol creates an opportunity for European public institutions (or anyone else) to reach

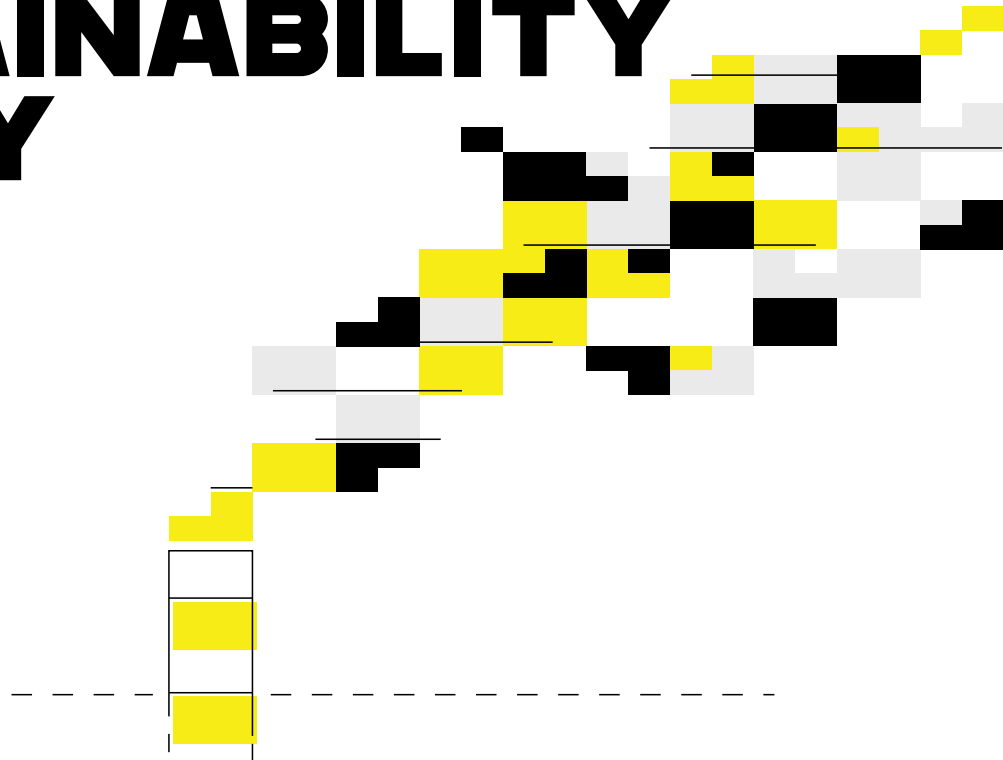
users through communication channels that they control. Such a capability is in line with Europe's vision of digital sovereignty. Investment in public, self-managed infrastructure will also ensure the sustainability of the Fediverse.

## **EUROPE'S OPPORTUNITY**

Twitter's demise and the ascent of the Fediverse open a window of opportunity for building more robust [digital public spaces](#). The EU ought to create the conditions for public and governmental institutions, non-profit organizations, and citizens' initiatives to invest in their autonomous communication infrastructure. Public and government institutions should be required to establish a presence in the Fediverse, and some of them – such as public media or educational institutions – have an obligation to host citizen accounts. This will provide public institutions with sovereign means of communication and ensure citizens have access to a more diverse and equitable communications network.

This necessitates backing through regulatory measures and investment in the Public Digital Infrastructure. The review of the DMA interoperability provisions in 2026 ought to target an expansion of their scope to encompass, at the very least, social networking platforms. The EU must endorse the democratic, multi-stakeholder management of protocols like ActivityPub. Ultimately, the provision, development, and maintenance of the services constituting the Fediverse merit support through a [European Public Digital Infrastructure Fund](#).

# — A COMPREHENSIVE ICT ENERGY SUSTAINABILITY POLICY



**THE GOVERNANCE OF DIGITAL INFORMATION** and communication technologies (ICTs) must prioritize, rather than undermine, the public interest. This requires that ICTs be open, interoperable, and environmentally sustainable. Given the climate crisis and the fact that ICTs contribute significantly to global carbon emissions and electricity consumption, it is imperative to ensure that ICTs are developed and used in a responsible and resource-efficient manner. This is in line with the overarching goal of sustainable and non-exploitative resource management, which is a key component of the Digital Commons.

Despite the urgent need, the European Union (EU) lacks a coherent policy to address the energy and, more generally, environmental sustainability issues raised by digital technologies. The current approach to addressing these issues is fragmented and lacks a comprehensive strategy.

For example, software, which drives the energy needs of ICT infrastructure, is largely unregulated from an environmental perspective. The forthcoming EU Ecodesign Regulation has been described as a “cornerstone of the Commission’s approach to more environmentally sustainable and circular products.” However, because “products” are defined as “physical goods,” software is not treated as a separate product group. As a result, software products remain outside the scope of the proposal and fall through the cracks of the ecodesign requirements.

This is a significant gap, especially given the rapid proliferation of AI systems that consume significant amounts of energy. While there is growing concern about the high energy consumption of AI, when it comes to regulatory requirements, those proposed in the upcoming AI Act are limited to certain types of AI systems only and constrained to monitoring energy consumption.

Similarly, the [updated Energy Efficiency Directive](#) includes a requirement to monitor the energy performance of data centers. However, this monitoring requirement does not require efforts to reduce energy consumption and ensure their more sustainable use. In particular, the energy performance of data centers is affected by many factors, such as the type of software applications and the efficiency of the software code. As a result, initiatives to improve data center energy efficiency will be ineffective unless they address both the hardware and software layers.

## **WHAT NEEDS TO BE DONE?**

The EU needs to make a concerted effort to formulate a unified and comprehensive ICT energy sustainability policy. Although existing initiatives and legislation – including the forthcoming EU Ecodesign Regulation, the Energy Efficiency Directive, and the AI Act – individually aim to improve the environmental sustainability of digital technologies and infrastructures, the lack of an overarching framework specifically tailored to the multifaceted dimensions of ICT is a potential barrier to the effectiveness of these efforts.

The close relationship between the energy consumption of hardware and the software products they host, including AI systems, underscores the importance of developing a comprehensive policy that addresses both layers. Efforts to improve the energy efficiency of ICT must go beyond hardware considerations and include software optimization. The call to establish requirements for software-driven energy efficiency, energy consumption reduction, and digital sustainability is not new, but it has gained momentum with the rise of AI products and services.

The energy consumption of AI systems and the energy sustainability of software are both intertwined aspects of the larger effort to make digital technologies more environmentally friendly. A comprehensive ICT sustainability policy would help address the climate crisis by incentivizing lower overall energy consumption, while benefiting society through more sustainable and responsible resource use. Such a unified policy would provide clarity for researchers and businesses and foster a collaborative effort to advance sustainability goals in the digital realm.

# EUROPE'S OPPORTUNITY

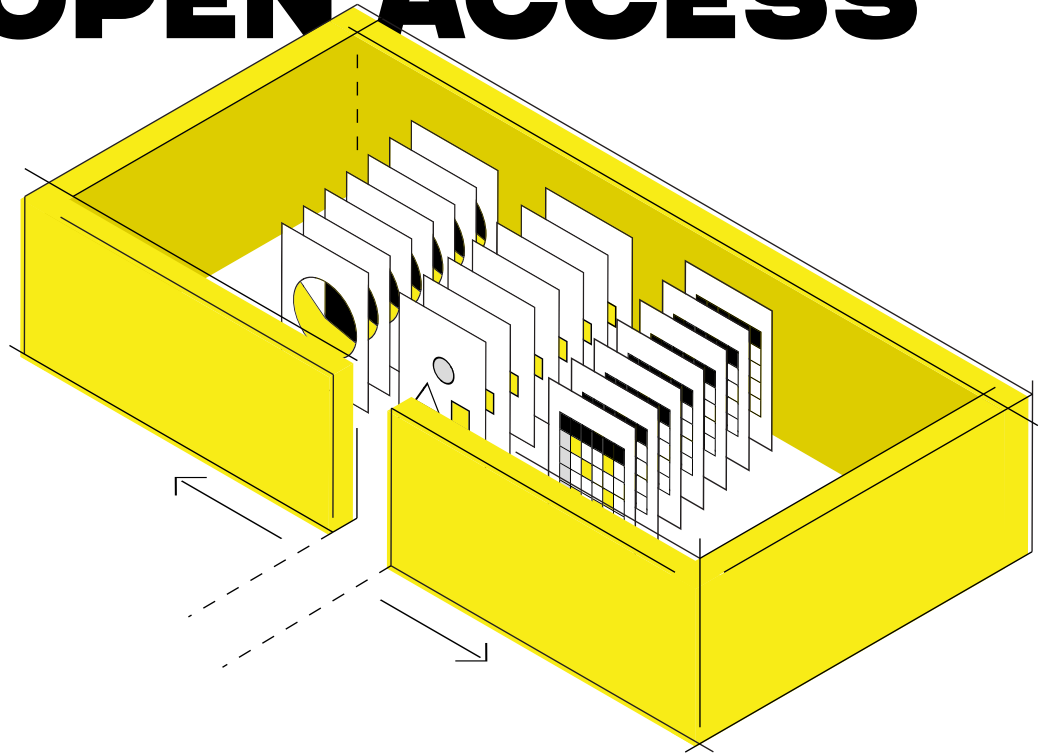
The proposed action includes the establishment of a comprehensive EU policy on the energy sustainability of ICTs (a “Digital Technologies Energy Sustainability Act”), focusing on both hardware and software components.

Key elements of this regulation should include energy efficiency standards for both hardware and software, guidelines for responsible energy use, and incentives for the development and adoption of technologies that use less energy.

The regulation should also include monitoring and reporting mechanisms to track progress and enforce compliance.

Such a regulation, focused on enforcing sustainable practices across the ICT sector, would provide a missing link between the digital and green transitions. This approach would contribute to the creation of a greener and more sustainable digital landscape in the European Union, reinforcing efforts toward a more resilient and sustainable future.

# — A PUBLIC INFRASTRUCTURE FOR OPEN ACCESS



**TO ADDRESS THE WORLD'S GREATEST CHALLENGES**, research needs to be open. During the pandemic, publishing companies dropped their paywalls to COVID-19-related articles, and researchers were able to share their work freely. Many have concluded that the open sharing of COVID-19 research accelerated the development of treatment protocols and vaccines.

However, the current academic publishing system, built on the free labor of scholars, produces high-priced commercial journals that are inaccessible not only to most fellow researchers but also to nearly all practicing physicians, journalists, policymakers, and citizens. These journals do not facilitate the sharing, collaboration, and coordination necessary to provide solutions to society's most demanding needs. This has led to a call for [Open Access](#), which is the free online availability of peer-reviewed research articles.

Today, approximately half of all research articles are Open Access and freely available to read, yet new barriers have been created for authors to publish. These barriers, including [Article Processing Charges \(APCs\)](#) and the current academic incentive structure, are not impacting authors evenly. [There is growing recognition that open-access publishing models that rely on APCs paid by authors are neither equitable nor sustainable.](#) Researchers, including those early in their careers, as well as those in the Majority World, often lack the financial resources necessary to pay APCs. What is more, instead of negatively impacting the profit

margins of commercial academic publishers – which currently yield up to 40% profit – open-access publishing models have provided a new revenue stream for publishers through high-priced APCs.

In addition to the content itself, the infrastructure on which research resides must be open, too. Over the past ten years, much of the critical infrastructure supporting open-access content, including F1000, SSRN, and bepress, has been acquired by commercial publishers. Open-access research is at risk of enclosure when hosted on a closed, proprietary, or commercial infrastructure.

## **WHAT NEEDS TO BE DONE?**

The European Union (EU) has already adopted a mandate for the open sharing of the research it funds through the Horizon 2020 Programme (with a 6-12 month embargo period). Yet obstacles still remain. To address these, last year under the Swedish Presidency, the EU Council released Conclusions calling on the European Commission and Member States “to support policies towards a scholarly publishing model that is not-for-profit and open access, with no costs for authors or readers.” The Conclusions are comprehensive and widely endorsed and recommend a move away from APCs, support for nonprofit publishing, no embargoes for research articles, reform of research assessment, and the investment in non-profit open-source infrastructures for publishing.

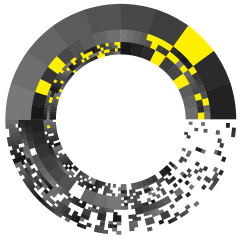
The support of non-profit, community-driven, open-access publishing and infrastructures is essential to advance equitable access to scholarly communications. It is an important pillar of the Digital Commons. This approach focuses on publicly funded, scholar-led initiatives that develop infrastructures and capacities to support journals without the need to outsource to commercial publishers. The Commission recently issued a tender to support global cooperation in non-profit open-access publishing, which, in addition to Member States, is open to many countries in the Majority World. This type of global collaboration is crucial, as Latin America pioneered non-commercial open-access publishing, yet the publishing ecosystem in the region is under threat from the troubled APC model developed in the Minority World. The Commission is also considering how to transition Open Research Europe (ORE), the open-access platform for European Commission-funded research, into a non-profit European publishing platform open to all. Currently, ORE is hosted by F1000, which is owned by the commercial publisher Taylor & Francis. In December, the Commission issued a tender for the development of an open-source publishing platform that will “underpin” ORE as of 2026.

## EUROPE'S OPPORTUNITY

The EU should swiftly adopt measures to support non-profit, community-driven open-access publishing by moving away from APCs, establishing a policy of no embargoes for research articles, reforming research assessment, and building on its funding program by developing a policy in support of global cooperation. In addition, the Commission should move to quickly ensure that the entire ORE platform is hosted on the Public Digital Infrastructure.

However, the most sweeping tool at the EU's disposal is the introduction of harmonized secondary publishing rights for publicly funded research. This would give authors the right to make their works open access through repositories without regard to the terms of the publishers' contracts. While seven Member States have such rights in their national legislations, six carry embargo periods ranging from 6-24 months. To allow for the open sharing of research to tackle the mounting global challenges facing society, the EU should introduce harmonized secondary publishing rights for the immediate sharing of publicly funded research – either as a stand-alone measure or – as we propose elsewhere – as part of a Digital Knowledge Act.





**OPEN  
\_FUTURE**

Open Future is a European think tank that develops new approaches to an open internet that maximize societal benefits of shared data, knowledge, and culture.



This report is published under the terms of the Creative Commons Attribution License.

**KEEP UP TO DATE  
AND SUBSCRIBE  
TO OUR NEWSLETTER**

**SUBSCRIBE**

**HELLO@OPENFUTURE.EU**

