ATARCA

Project deliverable 3.2 (D3.2)

Policy recommendations and roadmap for regenerative digital economy of the EU

31.03.2023

ATARCA

Grant agreement number: 964678

Project acronym: ATARCA

Project full title: Accounting Technologies for Anti-Rival Coordination and Allocation

Deliverable number	D3.2
Deliverable responsible	Demos Research Institute
Authors	Anna Björk Johannes Mikkonen Atte Ojanen Bhuvana Sekar
Dissemination Level	Public document

Contributors: Streamr Network

Associacio Novact

Qbit Artifacts

Aalto University

ATARCA

Table of Contents

ATARCA

1. Introduction

While digital technologies have become the driving force of our economic system, they also fit poorly together with economic structures of the industrial era. As such, the European Union's quest for a Europe fit for the digital age[1] cannot be achieved without fundamental changes at the intersection of technology and economy.

ATARCA argues that the current economic institutions need reform to fully account for the anti-rival nature of digital goods and some types of positive externalities, which gain value the more they are shared and generated, unlike physical goods.

This publication outlines policy recommendations for enabling the anti-rival economy[2] of digital goods and some forms of positive externalities. This output is based on work conducted in the ATARCA project, including stakeholder collaboration and details a roadmap for prioritizing the recommendations in the following seven years, aiming at transforming the European data and digital economy.

ATARCA - Accounting Technologies for Anti-Rival Coordination and Allocation

Digitalization transforms data, information, and knowledge as key economic success factors. Digital goods – based fundamentally on digitally storable, replicable, and transmittable information – require redefining business models, altering operational structures, and adopting strategic change. In ATARCA, we focus on Distributed Ledger blockchain technologies to promote an efficient economy of digital and other anti-rival goods3.

---

[1] A Europe fit for the digital age. (2020, February 19). European Commission. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en

[2] Nikander, P., Eloranta, V., Karhu, K. and Hiekkanen, K. (2020). Digitalisation, anti-rival compensation and governance: Need for experiments. In *Proceedings of Nordic Workshop on Digital Foundations of Business, Operations, and Strategy, Espoo, Finland.*

[3] Nikander, P., Eloranta, V., Karhu, K. and Hiekkanen, K. (2020). Digitalisation, anti-rival compensation and governance: Need for experiments. In *Proceedings of Nordic Workshop on Digital Foundations of Business, Operations, and Strategy, Espoo, Finland.*

ATARCA

Regarding methodology, the publication builds on four policy observatories, each engaging with around 30 participants with expertise in European economic policies, data economy and distributed ledger technologies (DLT) such as blockchain.

Furthermore, ATARCA's policy advisory board, internal policy impact and communication task force, and five external dialogue events have also contributed to the publication (see appendix 5). Findings from the three pilot use cases[4] and scientific papers written during the ATARCA project have also been instrumental in understanding the theoretical and practical questions of the anti-rival economy.

The recommendations aim to extend the project's research and results beyond its immediate scope and stakeholders. To clarify our understanding of the overall societal potential of combining anti-rivalry and DLTs towards a regenerative digital economy (section 2), we outline a) the mismatch between the economic structures and digital potential and b) the importance of combining anti-rivalry with the capturing of positive externalities of data, and digital and other positive subtractable goods (2.1 & 2.2). While this approach does not provide an overarching view of the rich academic research and results generated throughout the ATARCA project, it does help to articulate the links between this work, the current European policy landscape in the realm of economic and digital policies (such as the European Blockchain Strategy[5]).

As ATARCA's ambition suggests, and as we argue in section 2, the implications of the project's ground-breaking research can guide our thinking on how anti-rival goods could potentially transform the digital economy from the paradigm to the practice level. In section 3, we will outline the current European Union policy landscape regarding digital and economic policies (e.g., DLTs and blockchain), focusing on the intersection at which anti-rival goods are especially relevant. Finally, section 4 will detail the policy recommendations and the roadmap to support their implementation.

---

[4] Read more on use cases: https://atarca.eu/

[5] Blockchain Strategy. (2023, February 14). Shaping Europe's Digital Future. https://digital-strategy.ec.europa.eu/en/policies/blockchain-strategy

ATARCA

ATARCA Policy Observatory and Policy dialogue sessions

To gain a comprehensive understanding of the concept of anti-rivalry from broader societal and political perspectives, ATARCA's impact creation activities included four policy observatory sessions and five policy dialogue sessions. Guided by a pre-designed plan for the observatories to cover relevant perspectives, the project looked to combine its research and experimentation activities with a policy landscape analysis and stakeholder management. The policy observatories were intended to collect insights and inputs for ATARCA's project team on their work while also disseminating the project's approach and findings to a broader audience. In contrast, the dialogue sessions aimed to take a step beyond the immediate policy scope of ATARCA and explore the applicability of its approach and results in extended contexts and for diverse audiences. Detailed reports from observatories and dialogue sessions are available in Annex 5.

ATARCA

2. Building a regenerative digital economy

2.1. The mismatch between the economic structures and the digital potential

Digital technologies play an increasingly prominent role in organizing our daily lives, be it in the domain of education, democratic participation, or the economy. Digitalisation has become the driving force of our economic system with fundamental implications for human interaction and societal power structures. Yet, technological development has created novelties that fit poorly with institutional structures and governance architecture created in the previous era[67]. We argue that our current economic structures and institutions need fundamental reform to leverage digital resources fully.

The current value-creation processes in our economic system are based largely on increasing resource extraction. In this way, digitalisation has been used to capture value out of emergent resources, including the interaction between users on digital platforms. A primary source of added value is often the increased availability of information or other immaterial and intangible goods (raw data, software, communication, etc.). This increased availability of information is enabled through increased resource sharing, especially when the costs of sharing are minimal compared to its benefits. The emergence of this new reality has rendered some of the traditional paradigms of economic thinking obsolete.

---

[6] Nikander, Pekka; Elo, Tommi (2019) : Will the data markets necessarily fail? A position paper, 30th European Conference of the International Telecommunications Society (ITS): "Towards a Connected and Automated Society", Helsinki, Finland, 16th-19th June, 2019, International Telecommunications Society (ITS), Calgary;

[7] P. Nikander, V. Eloranta, K. Karhu, and K. Hiekkanen, "Digitalisation, anti-rival compensation and governance: Need for experiments," Nordic Workshop on Digital Foundations of Business, Operations, and Strategy, Espoo, Finland, p. 7, 2020

ATARCA

The theoretical foundations for understanding anti-rivalry have been discussed for over a decade. Traditionally, economists have divided goods into rival and non-rival goods[8]. This logic only partially applies to digital goods as they reach beyond this axis towards an additional category of anti-rival goods[9] [10]. In economic terms, their subtractability is negative: unlike scarce physical goods, the more they are used, the more they gain value[11]. In other words, anti-rival goods can be characterised by their positive externalities for the rest of society. An anti-rival resource (or good) gains value when used, contrary to the typical rival resource. Anti-rival goods can be divided into "network goods", which subtractability is negative, typically due to network effects, but that are excludable, and "symbiotic goods," which subtractability is negative and which are non-excludable[12].

[8] Reiss, J. (2021). Public Goods. The Stanford Encyclopedia of Philosophy (Fall 2021 Edition), Edward N. Zalta (ed.), URL = https://plato.stanford.edu/archives/fall2021/entries/public-goods/.

[9] Nikander, P., Eloranta, V., Karhu, K. and Hiekkanen, K. (2020). Digitalisation, anti-rival compensation and governance: Need for experiments. In Proceedings of Nordic Workshop on Digital Foundations of Business, Operations, and Strategy, Espoo, Finland.

[10] Ostrom, E. (2005). Understanding Institutional Diversity. Princeton University Press.

[11] Weber, S. (2004). The success of Open Source. Harvard University Press.

[12] Nikander, P., Eloranta, V., Karhu, K. and Hiekkanen, K. (2020). Digitalisation, anti-rival compensation and governance: Need for experiments. In Proceedings of Nordic Workshop on Digital Foundations of Business, Operations, and Strategy, Espoo, Finland.

ATARCA

Table 1. The six types of rival, nonrival and anti-rival goods (Nikander et al., 2020)

Excludability	Subtractability		
	Rival	Nonrival	Anti-rival
Excludable	Private goods (e.g. coffee)	Club/toll goods (e.g. museum visit)	Network goods (e.g. Fortnite)
Non-excludable	Common-pool goods (e.g. ocean fish)	Public goods (e.g. public beach)	Symbiotic goods (e.g. internet)

However, our current economic structures fail to identify and proliferate anti-rival resources. Private markets are not equipped or structured with the right incentives to function efficiently with anti-rival goods. Instead, they underproduce goods with positive externalities (e.g., education and vaccinations) since they cannot capture their benefits privately, leading to market failures that require states to step in with regulations, subsidies, or other measures. In conclusion, classical laws of supply and demand do not hold for anti-rival digital goods including data[13].

Of course, for example, open-source software development has been successful in facilitating anti-rivalry through transparent and merit-based accounting for decades[14]. However, alternative systems are either relatively small-scale (based on interpersonal trust or an agreement of a limited set of actors), based on institutional power (public funding), or fit only in specific contexts (computer programming). That suggests that due to a lack of knowledge and established mechanisms for compensating the production, analysis, and sharing of data, traditional notions of goods are used, with currencies being used to compensate for data products and imposing artificial scarcity for digital goods. That hinders broader societal benefits that could be realised, like widespread access to knowledge.

---

[13] Mueller, M. (2008). Info-communism? Ownership and freedom in the digital economy. First Monday, 13(4).

[14] Von Hippel, E., & Von Hippel, E. (2006). Democratizing Innovation. Amsterdam University Press.

ATARCA

At the same time, the global economy is becoming increasingly reliant on data[15], and many have hoped for digital transformation to revitalise our economic system in a manner that mitigates economic inequality[16] and ecological degradation. The incompatibility between anti-rivalry and our current economic system suggests that fundamental reforms of economic policies are needed to efficiently allocate digital and other anti-rival goods, and to distribute their benefits in socially optimal and equitable ways. For now, and in the near future, we need to build on long-term research and sociotechnical innovations to develop a comprehensive analysis of how these fundamentals are challenged, investigate how to build on the existing initiatives, and ideate avenues for novel innovation altogether.

---

[15] Statista. (2022, August 5). Biggest companies in the world by market value 2022.
https://www.statista.com/statistics/263264/top-companies-in-the-world-by-market-capitalization/

[16] Chancel, L., Piketty, T., Saez, E., & Zucman, G. (Eds.). (2022). World inequality report 2022. Harvard University Press.

ATARCA

2.2. Capturing the positive externalities of data and digital goods for a regenerative digital economy

While applications of blockchain and web3 can perpetuate the extractive practices of current capitalism[17], it is arguable that distributed ledger technologies also provide a way to intentionally structure economic interactions towards more sustainable and democratic modes of production[18][19]. ATARCA use cases have been exploring the possibilities of utilising DLT-based solutions to create new incentives and mechanisms for anti-rival data sharing and for proliferating positive externalities with anti-rival value. From a technological perspective, it has meant developing institutions and incentive systems based on cryptographic tokens[20] [21].

By identifying the anti-rival nature of digital goods and leveraging DLT to create new mechanisms and models of sharing data, we aim to promote a regenerative digital economy. This refers both to i) ecological regeneration: societies and economies that are based on giving back to nature, instead of taking from it and extracting resources for eternal growth; and ii) social regeneration: people have autonomy, independence, and ownership to contribute to economic development individually and collectively.

Regeneration in the context of the digital economy is based on three shifts (see image 1):

- sustainable prosperity in the economic paradigm
- commons-based participatory economy[22]
- regenerative value creation models in the business models and practices

---

[17] Pennington, A. (2022, September 14). Is Web3 Actually a Capitalism Long Con? NAB Amplify. https://amplify.nabshow.com/articles/ic-wait-is-web3-just-recalibrated-capitalism/

[18] Friedman, N., & Ormiston, J. (2022). Blockchain as a sustainability-oriented innovation?: Opportunities for and resistance to Blockchain technology as a driver of sustainability in global food supply chains. Technological Forecasting and Social Change, 175, 121403. https://doi.org/10.1016/j.techfore.2021.121403

[19] Berg, C., Davidson, S., & Potts, J. (2019). Capitalism after Satoshi. Journal of Entrepreneurship and Public Policy, 9(2), 152–164. https://doi.org/10.1108/jepp-03-2019-0012f
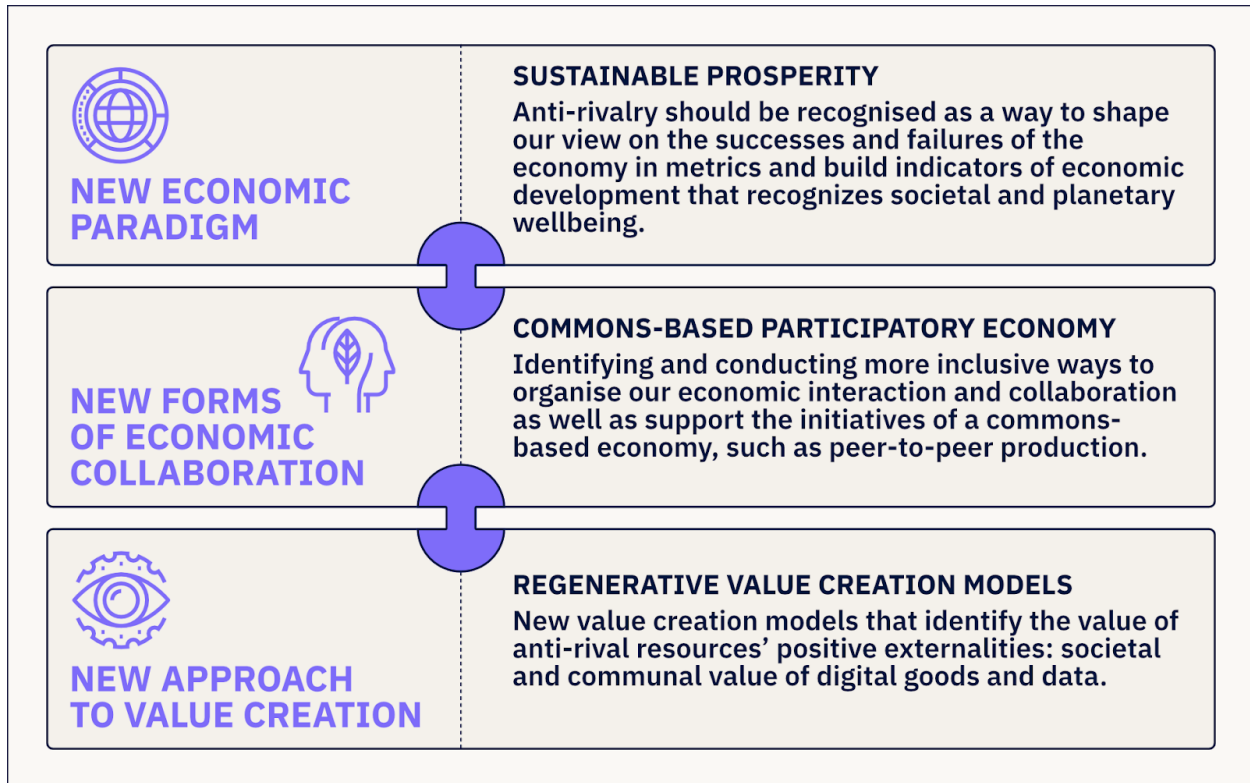
[20] ATARCA Project Deliverable 2.1 (D2.1): Report on Crypto-economic Mechanisms for Anti-rival Goods. (2022). In atarca.eu. https://atarca.eu/wp-content/uploads/ATARCA_d21_r2_v2_220624_funding-statement-added-1.pdf

[21] A new cryptographic token type is created, titled Shareable Non-Fungible Token (sNFT), which is a specific variant of the already well known Non-Fungible Token (NFT) read more: https://atarca.eu/wp-content/uploads/ATARCA_d21_r2_v2_220624_funding-statement-added-1.pdf

[22] With a commons-based economy we prefer to models and practices of socio-economic production in which large numbers of people work cooperatively and less hierarchical structures than those under a more traditional economy, Benkler (2016) The Wealth of Networks: How Social Production Transforms Markets and Freedom. Yale University Press. New Haven and London.

ATARCA

The first interlinkages leveraging DLT for changes in the digital economy have already become apparent in several DLT-based initiatives such as open-source software, community currencies and platform cooperatives. These initiatives can contribute towards recognising the value of non-profits, shared resources, and community work[23], thereby fostering economic stewardship of the commons.

Image 1. Three shifts for the regenerative digital economy. © Kirmo Kivelä

[23] Sierra, C. (n.d.). Report on 'Blockchains for Social Good.' In https://ec.europa.eu/.
https://ec.europa.eu/futurium/en/system/files/ged/workshopreport.pdf

Sustainable prosperity

Economic growth is traditionally measured as the percentage rate of increase in real gross domestic product, or real GDP. However, economic growth and progress are different phenomena, and measuring prosperity only via growth has led to socially and environmentally adverse outcomes[24]. Anti-rivalry provides a way to shape our view on the successes and failures of the economy, liberating prosperity from economic growth and placing the imperative of the planetary boundaries at the heart of economic policies.[25]

Commons-based participatory economy

Internet and digital technology has enabled new forms of interaction and organisation. For instance, digital platforms have demonstrated an ability to increase the capabilities of individual actors by giving them the tools to form necessary relationships. However, we are not able to derive social benefits from these opportunities. As Mulgan and Cox[26] argue the promise of decentralised technology has been to enable new decision-making rules, transparent and sometimes automated processes and contracts, built-in rewards and penalties for behaviours, and support for achieving consensus in large groups. These possibilities should be used to support commons-based economic governance[27] and more participatory and inclusive economic interactions and collaborations.

---

[24] Rethinking GDP -- Finance & Development, March 2017. (n.d.). https://www.imf.org/external/pubs/ft/fandd/2017/03/coyle.htm

[25] Sustainable Prosperity – Made in Europe. (n.d.). https://sustainable-prosperity.eu/story/

[26] Can new social and digital technologies transform governance? | Life Itself Labs. (n.d.). https://labs.lifeitself.org/writing/tech-governance

[27] Commons-based economic governance refers to governance and management of common resources and common interests by communities that sit outside the market-state conceptual dualism. See e.g.: https://jfsdigital.org/wp-content/uploads/2017/10/The-Rise-of-Commons-Based-Economic-Governance.pdf

ATARCA

Regenerative value creation models

The practice of extracting data from human interaction has resulted in the artificial scarcity of data and digital goods, from which large platforms have profited[28]. In response, datafication across society has contributed to increasing social and economic inequalities[29]. We need new value-creation models that enable social and planetary regeneration by identifying the value of anti-rival resources' positive externalities and the societal and communal value of digital goods and data. This implies creating new incentives and mechanisms for capturing value from data and digital goods, such as community governance, peer-to-peer interactions, and innovative product financing-business model patterns[30].

From a technological perspective, leveraging DLT for these three shifts requires efforts to develop a new medium of sharing that can capture the positive externalities of anti-rival systems. In ATARCA, we have designed experimental anti-rival technologies[31] and systems that 1) have the ability to take into account the specific characteristics of anti-rival resources, 2) incentivise individual and collective action on the production and sharing of resources, and 3) facilitate positive externalities and mitigate negative ones to overcome the tragedy of the commons[32].

---

[28] Sadowski, J. (2019). When data is capital: Datafication, accumulation, and extraction. Big Data &Amp; Society, 6(1), 205395171882054. https://doi.org/10.1177/2053951718820549

[29] Cinnamon, J. (2019). Data inequalities and why they matter for development. Information Technology for Development, 26(2), 214–233. https://doi.org/10.1080/02681102.2019.1650244

[30] ATARCA Project Deliverable 2.2 (D2.2): Report on anti-rival business model patterns (archetypes). (2022). In atarca.eu. https://atarca.eu/wp-content/uploads/atarca_d22_220930_finalF.pdf

[31] Read more about ATARCA use cases in Appendix 3.

[32] https://atarca.eu/wp-content/uploads/atarca_d22_220930_finalF.pdf

ATARCA

3. The policy landscape of ATARCA

To maximise the impact of research in ATARCA, the project's impact creation activities have identified relevant policies related to anti-rival opportunities, benefits, and pathways. The policy landscape analysis explores the EU's political initiatives and structures, particularly from the economic and technological development perspectives. The starting point for the analysis was to consider the institutional compatibilities and, especially, the incompatibilities in the EU priorities, strategy, and regulation related to the objectives of ATARCA. In other words, the analysis sought to identify areas where ATARCA's impact objectives aligned and resonated with existing policies and highlighted possible inadequacies and gaps between them.

The starting point for the analysis was the formation of the European digital economy which is an ongoing development as of the time of writing (March 2023). The digital markets have been recognised as a distinctive dimension in policymaking, with clear links to the European Union's digital and economic policies. Image 2 illustrates the identified policy processes, priorities, and strategies of the European Union related to ATARCA. These policy processes and strategies are categorised into three main areas: digital, economy and blockchain.

Image 2. Policy processes, priorities, and strategies linking to ATARCA.
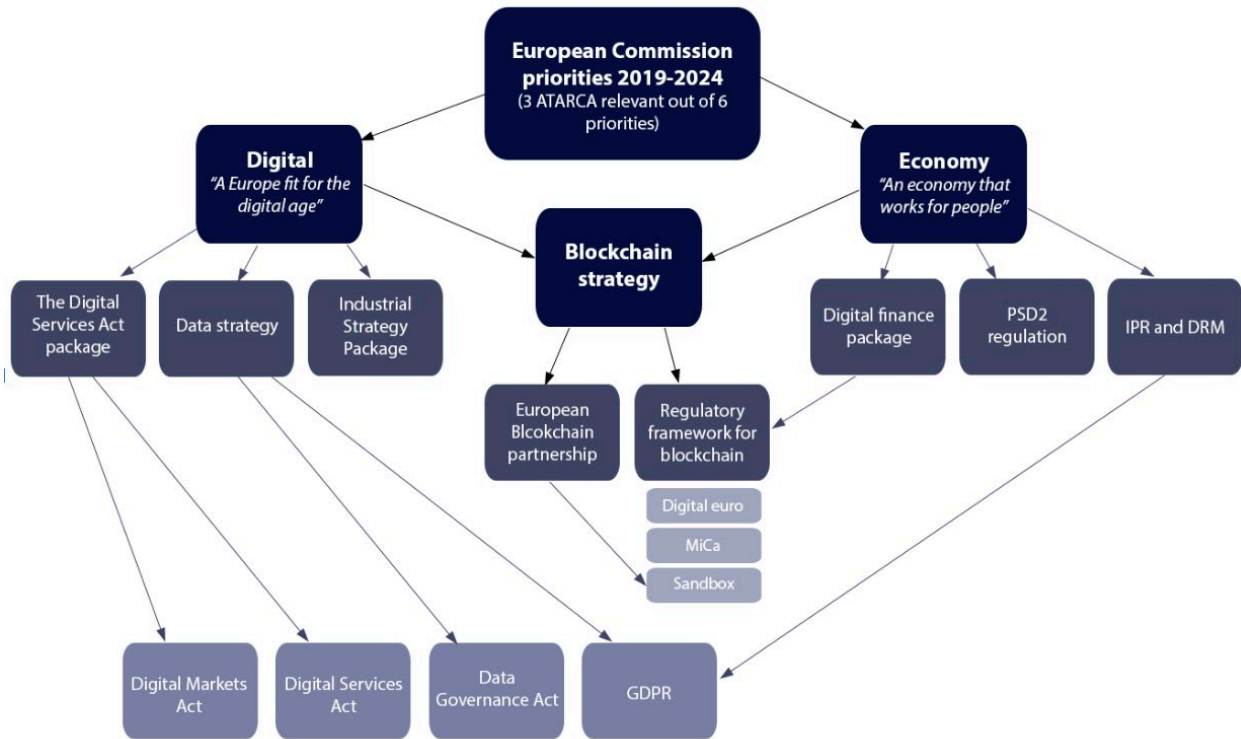
During recent years, the EU has established a distinctive position towards digitalisation (image 2), adopting strategies to advance ethical and human-centric development of AI, and endorsing a comprehensive digitalisation strategy called: "A Europe fit for the digital age"[33]. Through this strategy, the digitalisation pillar has been very relevant to ATARCA's key work regarding the organisation of European data regulation, digital markets, and digital services.

---

[33] A Europe fit for the digital age. (2020, February 19). European Commission.
https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en

From the **economic** perspective, ATARCA's research and technology ambitions were directed at introducing anti-rivalry as an approach to the development of digital markets. In the EC priorities for 2019-2024, the EU's "an economy that works for people"[34] is structured via five main policy areas, including "deepening the economic and monetary union", "fostering, and strengthening the EU single market" and "boosting job creation, growth, and investment" in different sectors [35]. Many sub-level policies, such as the *Single Market strategy*[36], the *Roadmap for deepening Europe's economic and monetary union*[37], and the *InvestEU*[38] programme built on the *Investment Plan for Europe*, were initiated in 2015-2017 but have continued to be shaped and implemented during ATARCA's project timeline (2021-2023).

At the intersection of the economic and digitalisation pillars, the EC has produced the **blockchain strategy**[39]. According to the strategy, the Union seeks to become the leading continent for blockchain innovations, applications, and companies. The Commission's 'gold standard' for blockchain technology mainly focuses on instrumental principles guiding the technology: data protection, cybersecurity, digital identity, interoperability, and environmental sustainability.

---

[34] An economy that works for people. (n.d.). European Commission. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/economy-works-people_en

[35] An economy that works for people. (n.d.). European Commission. https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/economy-works-people_en

[36] The single market strategy. (n.d.). Internal Market, Industry, Entrepreneurship and SMEs. https://single-market-economy.ec.europa.eu/single-market/single-market-strategy_en

[37] The Commission sets out a roadmap for deepening Europe's Economic and Monetary Union. (n.d.). European Commission. https://commission.europa.eu/publications/commission-sets-out-roadmap-deepening-europes-economic-and-monetary-union_en

[38] Home. (n.d.). InvestEU. https://investeu.europa.eu/index_en

[39] Blockchain Strategy. (2023b, February 14). Shaping Europe's Digital Future. https://digital-strategy.ec.europa.eu/en/policies/blockchain-strategy

ATARCA

The Blockchain Strategy[40] recognised the following elements

Building a pan-European public services blockchain: The European public sector is building its own blockchain services infrastructure, which should soon be interoperable with private sector platforms.

Promoting legal certainty: The European Commission aims to develop a clear legal and regulatory framework in areas pertaining to blockchain-based applications and innovations.

Increasing funding for research and innovation: The EU directs funding for blockchain research and innovation through grants, especially in areas like security, public services and sustainability.

Promoting blockchain for sustainability: Blockchain is seen to enable transparent accounting and traceability of carbon emissions across product value chains.

Supporting interoperability and standards: EU stresses the importance of standards in promoting the use of blockchain technology (e.g., digital assets, token specifications).

Supporting blockchain skills development: The Digital Europe Programme and specific projects like CHAISE are central to developing a talented pool of digital and blockchain experts.

Interacting with the community: Especially through the European Blockchain Observatory and Forum and the International Association of Trusted Blockchain Applications (INATBA).

---

[40] Blockchain Strategy. (2023b, February 14). Shaping Europe's Digital Future. https://digital-strategy.ec.europa.eu/en/policies/blockchain-strategy

ATARCA

Table 2. Relevant EU regulations and policies

Initiative	Key goals	Relevant issues and questions to promote anti-rival digital economy
Data Governance Act and Data Act[41]	Boost and regulate data sharing, leverage the potential of data	Kinds of incentives, mechanisms, and structures of data sharing the EU digital policies should support.
European Data Strategy[42]	Make EU the leader in a data-driven society	Institutional changes needed to facilitate anti-rival data sharing across the societal sectors and different Member States.
Digital Markets Act (DMA)[43]	Ensure fair and open data markets	Measures of governing intermediaries to enhance anti-rival data utilisation.
Digital Services Act (DSA)[44]	Ensuring a safe and accountable online environment Foster innovation, growth, and competitiveness within the single market	What is lacking from the Digital Service Act (DSA) to address the most crucial societal tensions of the platforms? Supporting anti-rival value creation within the platforms. Enhancing the development of anti-rival incentives for data sharing, anti-rival value creation models and supporting start-ups and companies with alternative business models to enter the European digital markets. Does the DSA address the societal tensions of the platforms?
Digital Finance Package and Digital Finance Strategy[45]	Regulate crypto-assets to increase investments and ensure consumer and investor protection	Ensuring the principles of GDPR and encouragement of data-sharing.

---

[41] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020PC0767

[42] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en

[43] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/digital-markets-act-ensuring-fair-and-open-digital-markets_en

[44] https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package

[45] https://finance.ec.europa.eu/publications/digital-finance-package_en

ATARCA

PSD2 (Directive (EU) 2015/2366)[46]	Deepening of the EU internal market via well-functioning and secure payment infra	Ensuring the principles of GDPR and encouragement of data-sharing. What would be a more communal approach to IPR? Measures that should be put in place to enhance anti-rival mechanisms. Alternative value creation models within platforms.
IPR and Directive on the Harmonisation of Copyright and Related Rights (DRM)[47]	Find a balance between the interests of right holders and users, protecting the original creative investment and enabling legal or licensed re-use by others, and to harmonise the IPR environment at the European level	
Blockchain Strategy[48]	Create a multi-stakeholder interaction and common infrastructure for blockchain development in Europe	Criteria needed for access within sandboxes to allow testing new data business models.
EC Blockchain regulatory framework[49]	Improve the development of digital currencies (digital euro) and fasten the development of the blockchain and innovation (regulatory sandbox)	

This policy landscape provides the context for the policy recommendations and changes proposed in the following chapter. These recommendations aim to contribute and complement the existing policy initiatives and processes, which have often focused on economic competitiveness, efficiency, and growth[50]. To fully grasp the opportunities of anti-rival goods and possibilities of DLT, there is a need to foster a trustworthy network of actors that see data as a public good.

---

[46] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32015L2366

[47] https://ec.europa.eu/information_society/doc/factsheets/020-ipr_drm-october04.pdf

[48] https://digital-strategy.ec.europa.eu/en/policies/blockchain-strategy

[49] https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-blockchain

[50] De Finance, S. (2020). EU competitiveness and global growth. In https://www.europarl.europa.eu/ (PE 652.060). EPRS | European Parliamentary Research Service. https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/652060/EPRS_BRI(2020)652060_EN.pdf

ATARCA

4. Policy recommendations and roadmap

ATARCA policy recommendations aim to steer economic development towards more regenerative forms by identifying the nature and benefits of anti-rival digital goods and utilising the opportunities of DLT to introduce new economic incentives and mechanisms suitable for the anti-rival economy. The recommendations comprise socio-economic approaches, models and practices and leveraging DLTs for the desired changes. The recommendations are divided into five domains (see image 3):
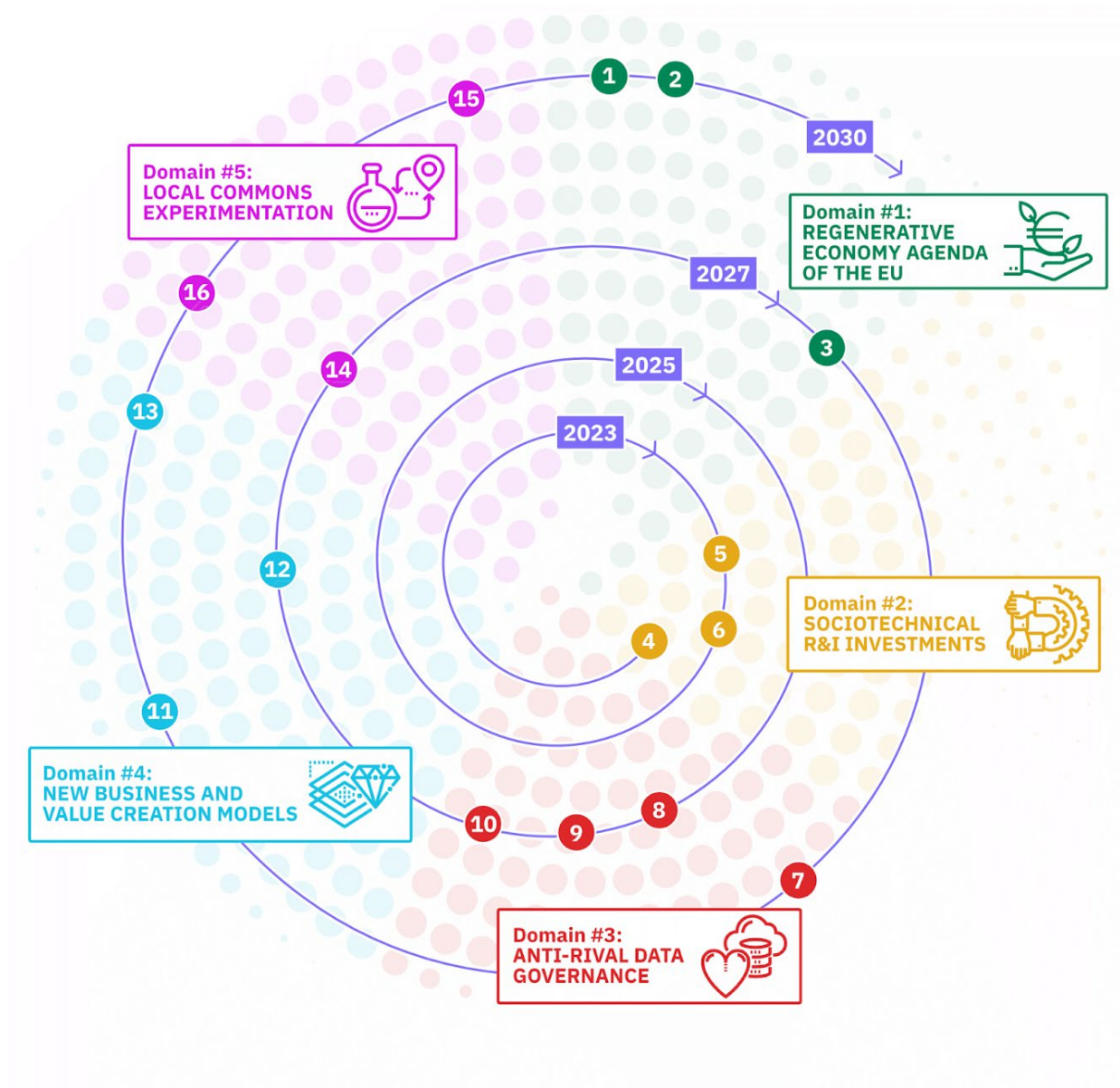
- Regenerative economy agenda of the EU
- Sociotechnical R&I Investments
- Anti-rival data governance
- Business & value creation models, and
- Local commons experimentation

Image 3. Five domains of ATARCA Policy Recommendations © Kirmo Kivelä
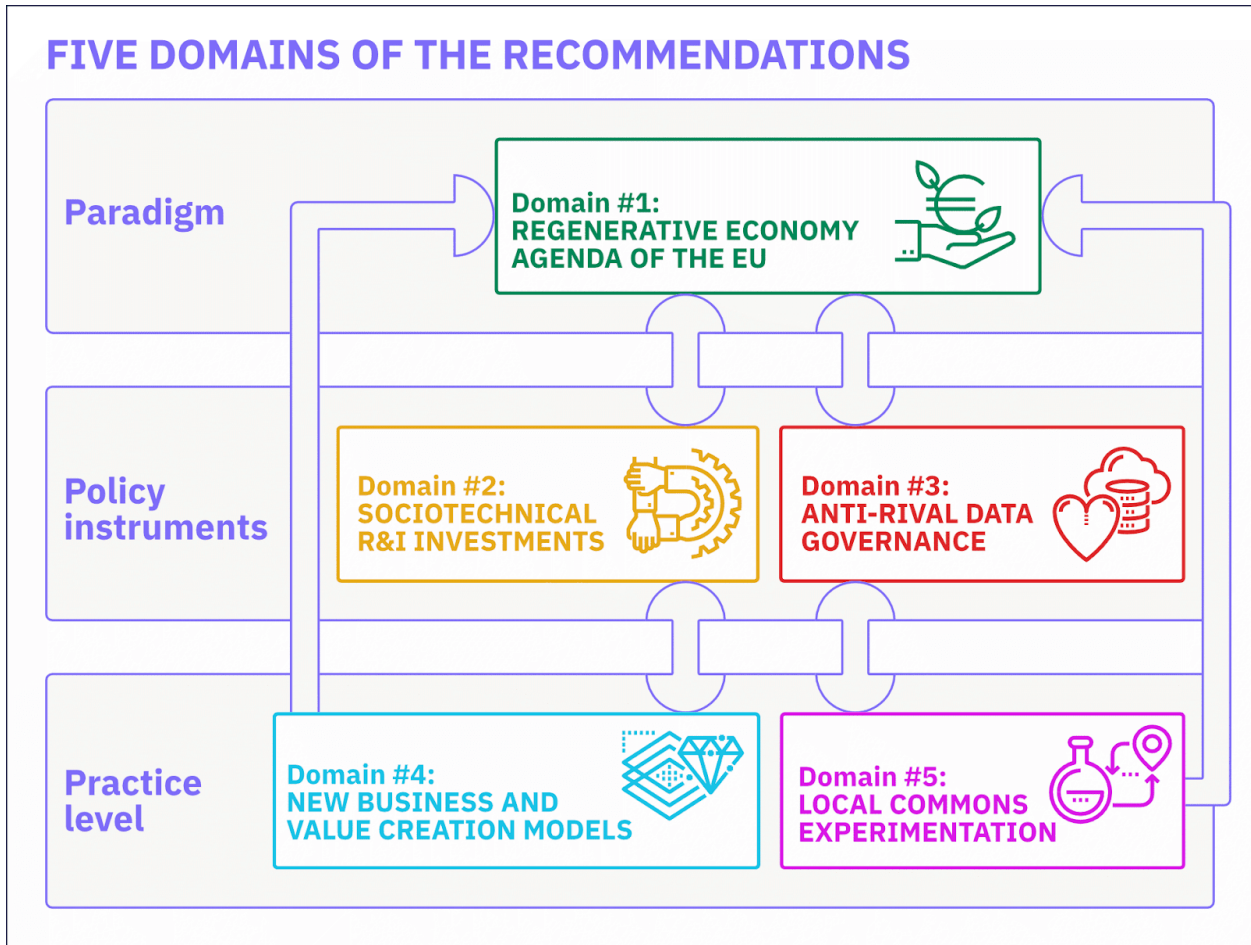
These policy recommendations are incorporated on a roadmap starting from the near future, 2023 until 2030 (see Image 4). Weaving through the five domains, these recommendations on the roadmap illustrate that the recommendations need to be considered in a holistic manner without interpreting them as sequential steps.

Image 4. The policy recommendations illustrated on a roadmap © Kirmo Kivelä

Domain #1:
REGENERATIVE ECONOMY
AGENDA OF THE EU

Domain 1: Regenerative economy agenda of the EU

Incorporating values, conditions, and approaches of a commons-based economy into the digital and economic policy agenda of the EU and experimenting with new governance methods and models for regenerative digital economy.

To realise the potential and benefits of digital transformation, the European Union needs to conceptualise and experiment with new models and premises for economic and digital governance and policies. Given that currently digital goods are viewed as rival resources, our ability to capture their potential as public goods and realise the transformative possibilities of emerging technology is greatly hindered. Implementing an anti-rival approach to the digital and economic policies of the EU could therefore strengthen access to information and unravel the positive externalities of a commons-based data economy.

1. **The EU should actively strengthen the connections and interactions between digitalisation and economic policies, while also extending focus beyond the realm of blockchain**

   a. The emergence of digital commons as a means of bridging economic activity and digitalisation should be supported through policies such as the European industrial strategy[51].

   b. Policy implications generated by the interlinkages of economy and technology, such as taxation of digital goods, should enable anti-rival business models and economic interaction.
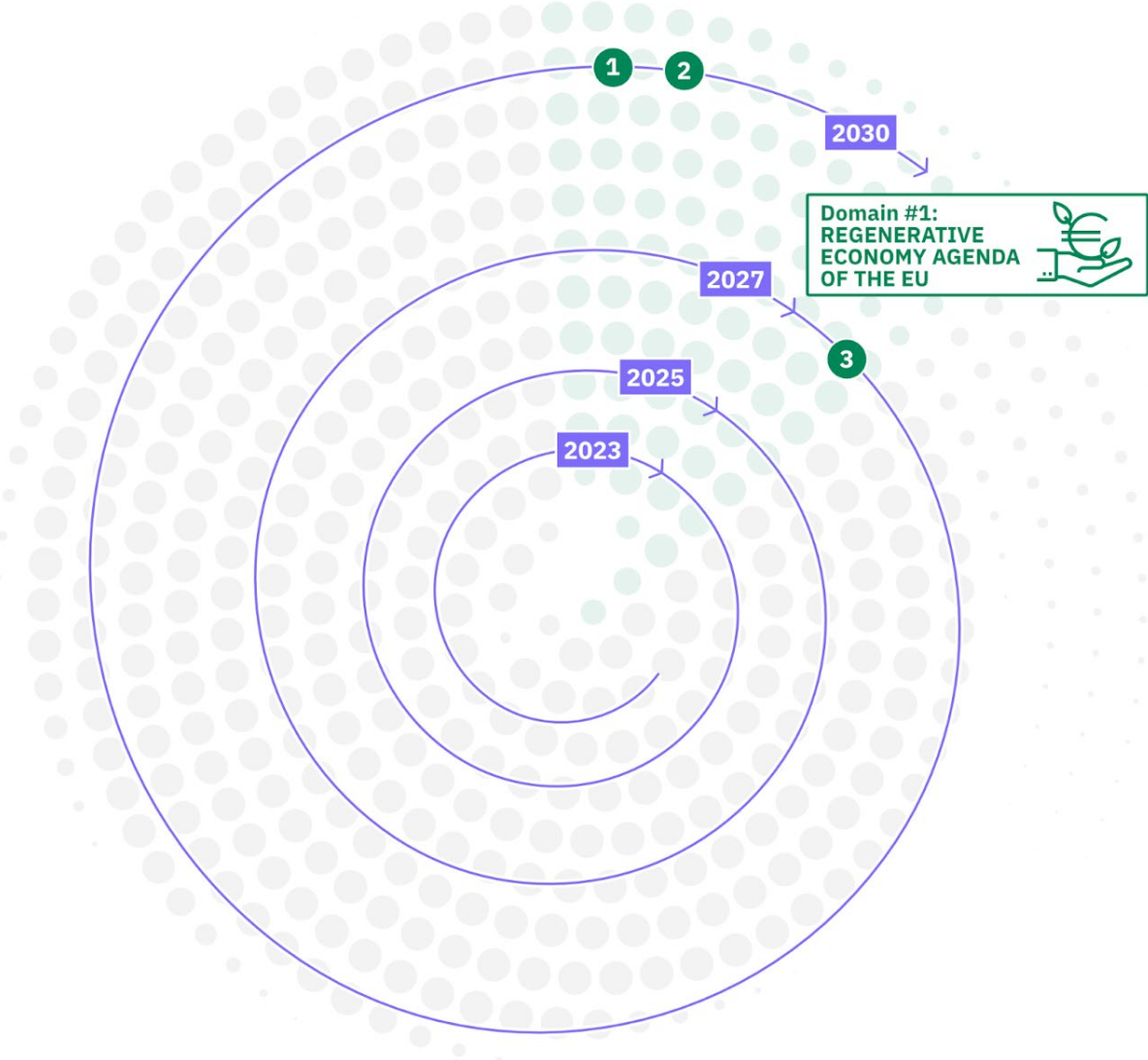
---

[51] Strategy. (n.d.). Internal Market, Industry, Entrepreneurship and SMEs. https://single-market-economy.ec.europa.eu/industry/strategy_en

ATARCA

c. The EU should build upon a mission-oriented innovation approach[52] towards the twin (green and digital) transition, for e.g., by utilising DLTs for material and emission tracking in the context of the Fit for 55 package[53].

2. **Anti-rivalry should be recognised and embedded in economic visions and policies of the EU in a cross-sectoral approach**

a. The EU should promote and expand political imagination for anti-rival economics and recognise the ideological and historical assumptions underpinning the current economic system, such as resource scarcity.

b. Anti-rivalry should be understood and approached broadly as a perspective connecting data commons, public goods, cooperatives, open-source resources, industry 4.0 development and sustainability issues, across policies.

c. Anti-rivalry should be incorporated into different policy sectors through experimenting with anti-rival mechanisms in diverse contexts such as green transition and community currencies.

3. **Experimental policymaking should test new solutions for the opportunities of data and digital economy**

a. The impact of economic efficiency as a principle should be evaluated through anti-rival experimentation, policy prototyping and test beds, for example in the context of European data strategy and knowledge commons.

b. The EU should develop capabilities and processes for technology foresight from the perspective of the digital economy to aid long-term economic and digital policy planning.

c. Experimentation should be designed to incorporate inclusive stakeholder engagement and multi-perspective deliberation in the context of digital policy, e.g., through living labs.

---

[52] Tran, S., Vij, M., Kumpf, B., Jhunjhunwala, P., Lee, Y., Hanson, A., C., Tabatadze, M., Kumpf, B., Asplund, V., & O. (2022, April 7). Mission-Oriented Innovation. Observatory of Public Sector Innovation. https://oecd-opsi.org/work-areas/mission-oriented-innovation/

[53] Fit for 55. (2023, January 12). European Council. https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/

ATARCA

Image 5. The policy recommendations illustrated on a roadmap for 'Domain 1' © Kirmo Kivelä

Domain 2: Sociotechnical R&I Investments

Research and innovation investments to support an inclusive sociotechnical approach to anti-rival economics and technologies.

Research and development investments can steer the momentum of DLTs and tokens for facilitating exchange of anti-rival and public digital goods. Funding should incentivise concrete piloting and use cases of anti-rival resource sharing in local communities, while also establishing long-term impact in and for the benefiting communities. Investments should promote inclusivity, whereby the affected groups have an integral role in the development processes.

4. **Public funding programmes should avoid falling into techno-solutionism[54] and instead promote inclusive socio-technical perspectives**

   a. Technical DLT developers should work in tandem with social science and humanities (SSH)[55] experts and economists to develop socially beneficial anti-rival applications and transition pathways to reform the data economy.

   b. Participatory co-design activities should be required to include the values and perspectives of affected communities and marginalised citizens into the technology design.

   c. The European Digital Innovation Hubs (EDIHs)[56] strengthen decentralised technology initiatives, including non-profit, open and diverse projects.

   d. DLT-based piloting should be based on transparency and ensure users' consent and controlling data by better enabling compatibility of blockchain with GDPR[57] in a privacy preserving manner.

5. **R&I investments through programmes such as Horizon Europe[58] should be steered to explore the anti-rival potential of data and digital goods and to develop tools to capture positive economic externalities of the data economy**

   a. Research funding should support research and development of common ownership models to ensure a functioning digital public good infrastructure.

   b. Funding should support the research and construction of free and open source decentralised technical infrastructure to increase 'evolvability' of technologies by the users themselves.

6. **Investments in DLT should support the development of new business, ownership, and governance models**

   a. The European Innovation Council's (EIC) funding programmes[59] should be used to incentivise radical economic experimentation with DLTs (for example basic income pilots[60]).

   b. The funding should support multi-stakeholder partnerships in the development of standards on deployment of smart contracts and digital signatures

---

[54] S. (2021, March 25). Techno solutionism—very few things actually need to be an app. Digital Rights Watch. https://digitalrightswatch.org.au/2021/03/25/technosolutionism/

[55] Social Sciences and Humanities. (n.d.). In the Cambridge Dictionary. https://dictionary.cambridge.org/dictionary/english/social-science?q=social+sciences

[56] Shaping Europe's Digital Future. https://digital-strategy.ec.europa.eu/en/activities/edihs

[57] GDPR.eu. (2019, February 19). General Data Protection Regulation (GDPR) Compliance Guidelines. https://gdpr.eu/

[58] Horizon Europe. (2023, February 8). Research and Innovation. https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en

[59] At the time of writing e.g., Pathfinder, Transition, and Accelerator

[60] Circles UBI | Wallet. (n.d.). https://circles.garden/welcome

ATARCA

Image 6. The policy recommendations illustrated on a roadmap for 'Domain 2' © Kirmo Kivelä
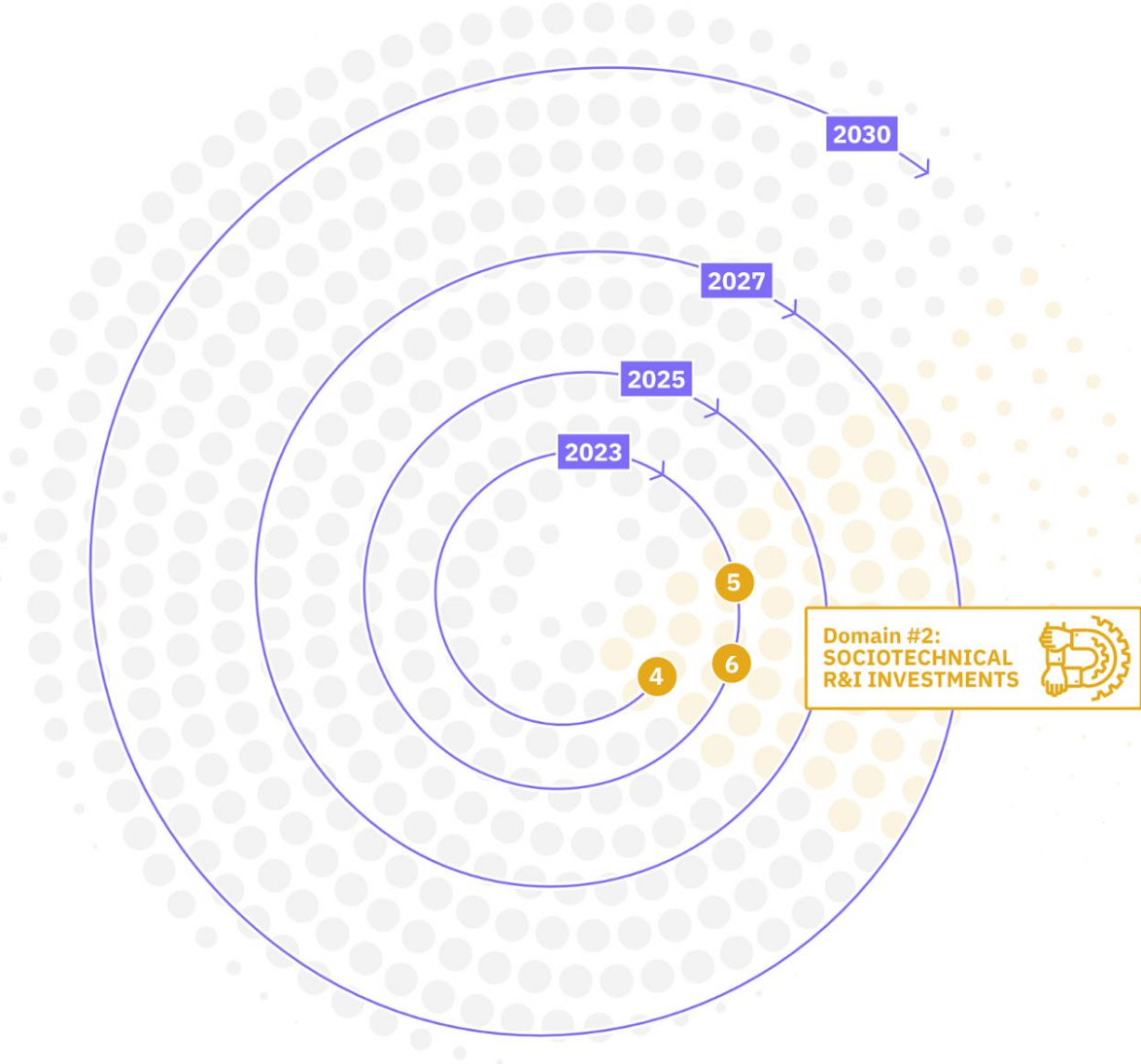
Domain 3: Anti-rival data governance

Data governance and regulation to support the incentives, mechanisms, and coordination of anti-rival resource sharing.

The EU should promote data governance that enables a commons-based data economy and incentivises data sharing in relevant ecosystems to utilise the positive externalities of data and digital goods. The market failures of data economy result in the under-provision of societally beneficial data, and a disproportionate concentration of resources on exploitative data uses, such as profiling and surveillance.

7. **Develop commons-based data governance such as data commons and unions**

    a. Expand the regulatory efforts around data commons such as Open Data Directive[61] into the private setting to support sharing of data for the public good.

    b. Create legal structures to support the establishment of data commons and unions enabling groups and communities (including marginalised and vulnerable groups), and their respective representatives to regulate the use of non-personal community data.[62]

    c. Develop and implement the management of data commons for example under the Ostrom's Eight Core Design Principles.[63]

---

[61] Open Data Directive. (n.d.). data.gov.ie. https://data.gov.ie/pages/open-data-directive

[62]https://www.researchgate.net/publication/343555556_Data_Sharing_Requires_A_Data_Commons_Framework_Law_DGN_Policy_Brief

[63] These principles also ensure that the scale of the data commons is appropriately defined and that different data commons cooperate in exploiting synergies among them.

ATARCA

8. **The Data Governance Act and Data Act should recognise data as an anti-rival good and conceptualise the data economy beyond market terms**

   a. Enhance 'data altruism' in Chapter IV of Data Governance Act (DGA)[64] into a more overarching concept for the whole regulatory act so that companies can access data donations if the data is collected for 'general interest' goals consensually.

   b. The Data Act (DA) and DGA should go beyond current conceptualisations of data as a common-pool or non-rival resource and explicitly recognize the anti-rival nature of data.

   c. Resolve the tension between data minimisation principle in GDPR and 'business to government' data sharing rules in the Data Act ~~(DA)~~[65] to promote socially beneficial data sharing.

9. **Quality, fairness, and privacy of data should be ensured in the context of anti-rival data sharing**

   a. The requirements for data quality under the AI Act[66] should be mirrored in other legislative endeavours related to data sharing such as Data Act[67] and Data Governance Act[68], as the benefits of data only accrue if the data shared is representative, unbiased, and consensual.

   b. Privacy and data rights enshrined in GDPR should include a more collective approach, since personal data protections are not enough when the potential harms are collective, and the data is shared widely.

---

[64] EUR-Lex - 52020PC0767 - EN - EUR-Lex. (n.d.). https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52020PC0767

[65] https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1113

[66] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52021PC0206

[67] https://ec.europa.eu/commission/presscorner/detail/e%20n/ip_22_1113

[68] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020PC0767

10. **The EU regulation of blockchain and tokens should not focus squarely on crypto-assets or digital finance, but also consider other uses and contexts of blockchain**

   a. The Markets in Crypto-Assets (MiCA)[69] regulation should better recognise utility tokens and shareable non-fungible tokens (sNFT)[70] as non-financial, yet socially valuable goods.

   b. The DLT Pilot Regime for market infrastructures[71] ought to foster innovations related to democratic funding, collective ownership, and equal digital rights, whether through token credentials or multi-signature wallets, rather than focusing on crypto-assets or securities as an end themselves.

---

[69] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0593

[70] https://atarca.eu/wp-content/uploads/ATARCA_d21_r2_v2_220624_funding-statement-added-1.pdf

[71] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0594

ATARCA

Image 7. The policy recommendations illustrated on a roadmap for 'Domain 3' © Kirmo Kivelä
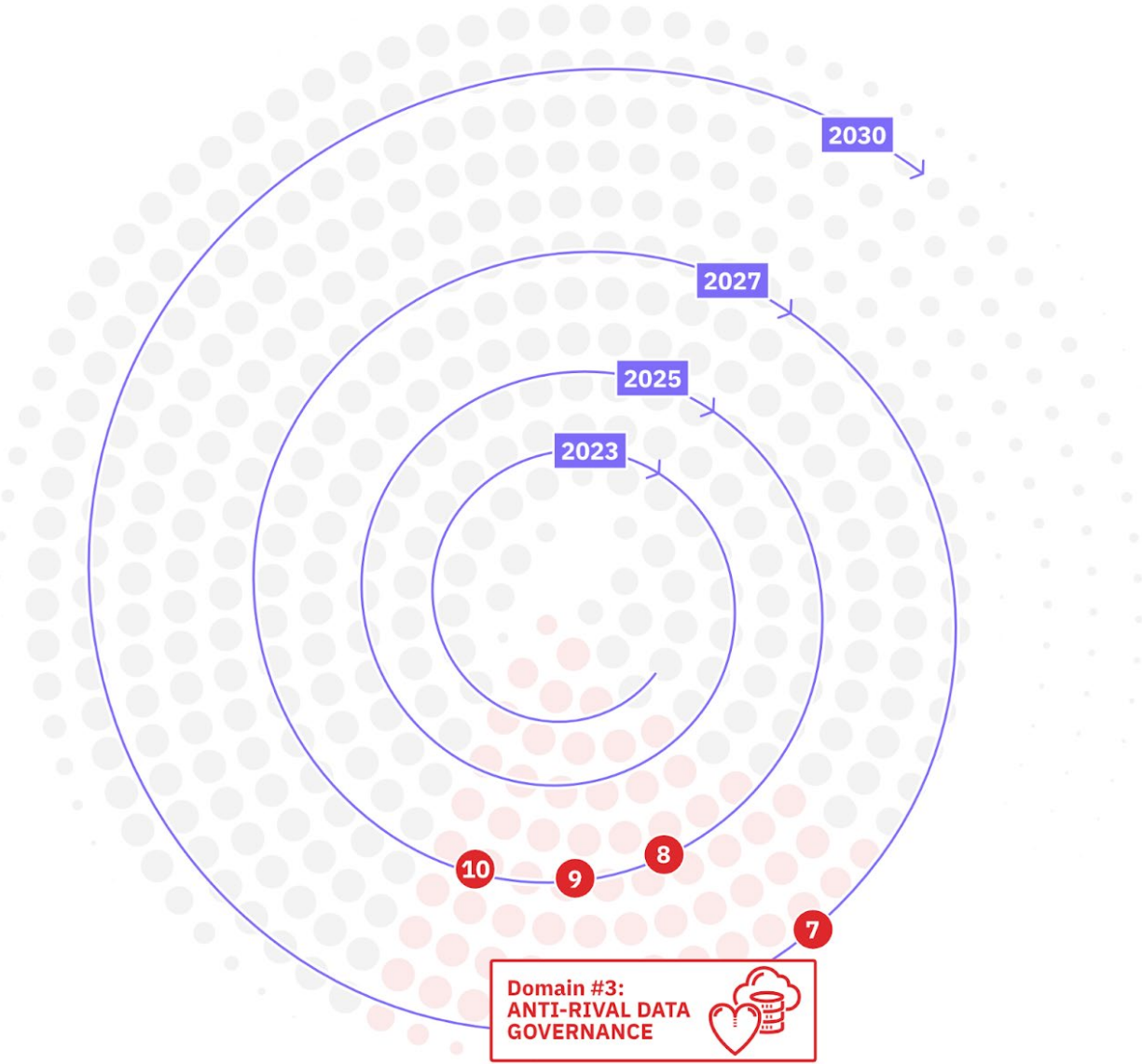
Domain 4: Value creation and business models

New business and value creation models to enable anti-rival compensation mechanisms that are aligned with regenerative digital economy.

The creation of value through digital resources should enable greater societal benefits. By developing anti-rival compensation mechanisms one can incorporate more actors and features into the value creation processes led by businesses. Business models such as open source and peer-to-peer make decentralised collaboration more efficient, facilitating the capture of positive economic externalities[72].

11. **Public and private sector organisations should collaborate to build business ecosystems and networks that develop anti-rival business models**

    a. Business model patterns that are either a) compatible or b) enablers of anti-rivalry ought to be more widely recognised and utilised. These include models like freemium, open-source, dual-licensing, crowdfunding, differential pricing, peer-to-peer, fractional and cooperative ownership among others[73].

    b. Increased cooperation between public and private technology developers, including sandboxes and residencies between organisations would enable better cross-sector understanding of anti-rival DLT solutions.

---

[72] https://atarca.eu/wp-content/uploads/atarca_d22_220930_finalF.pdf

[73] See more https://atarca.eu/wp-content/uploads/atarca_d22_220930_finalF.pdf

ATARCA

12. **Public institutions should promote and support digital public goods and digital open commons**

    a. The EU should promote digital open commons by establishing a 'European incubator for digital commons' as presented by the French presidency of the Council of the EU in June 2022[74].

    b. DLTs should be advanced as a common public good infrastructure, instead of speculative financial products. This can mean financing for digital public goods and decentralised governance with broader participation of the relevant user communities through initiatives such as GovStack[75].

    c. Public institutions should nurture and consolidate emerging hubs around anti-rival ecosystems and empower trends around open-source DLT repositories, in line with Digital Public Goods (DPG) charter[76].

13. **Introduce policies and regulation to foster anti-rival business strategies in the domains of digital services, open source and internet commons**

    a. Implementation of antitrust policies like the Digital Markets Act (DMA)[77] and Digital Services Act (DSA)[78] should consider how large online platforms may specifically limit the uptake of anti-rival digital goods, and tackle this by incentivising platform cooperatives.

    b. The European Commission should build on and implement its Open Source Software Strategy 2020–2023[79] to capture anti-rival value through open-source solutions and avoid issues such as vendor lock-in through public code.

    c. Anti-rival goods such as data and distributed ledgers should be seen as central parts of internet commons and more strongly integrated into the Next Generation Internet (NGI) initiative and ecosystem through NGI funding.

---

[74] https://ec.europa.eu/commission/presscorner/detail/en/ip_22_3898

[75] Home. (2023, January 20). GovStack. https://www.govstack.global/

[76] Digital Public Goods Charter. (n.d.). DPG Charter. https://www.dpgcharter.org/

[77] https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-blockchain

[78] https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package

[79] Open source software strategy. (n.d.-b). European Commission. https://commission.europa.eu/about-european-commission/departments-and-executive-agencies/informatics/open-source-software-strategy_en

ATARCA

Image 8. The policy recommendations illustrated on a roadmap for 'Domain 4' © Kirmo Kivelä
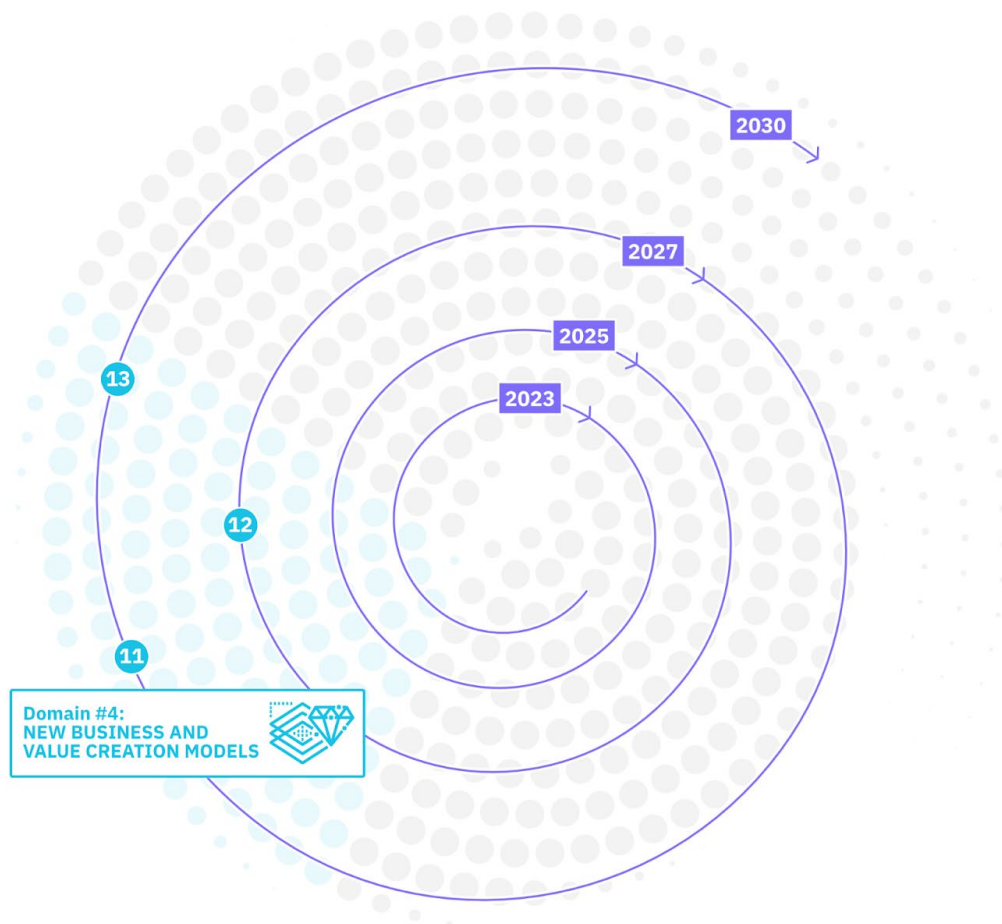
Domain 5: Local commons experimentation

Utilising DLTs for decentralised, democratic community collaboration and promoting grass-roots cooperatives through education and resources.

Emerging technologies including DLT and blockchain allow us to intentionally organise economic activity towards a collaborative and commons-based economy. On the local level, they can support the growth and coordination of community initiatives by for example forming data unions and decentralised autonomous organisations (DAOs) or by creating local currencies that recognise domestic labour.

14. **Steer DLT pilots and regulatory sandboxes towards community experimentation with platform cooperatives and democratic DAOs**

   a. Anti-rival experimentation should make use of the existing communities and platforms working on decentralised local solutions, for example by connecting with projects mapped in the European Commission's DLT4Good[80] project.

   b. The public sector should promote platform cooperatives as one way to respond to the needs of local communities.

---

[80] Foresight. (n.d.-b). #DLT4Good Scanning | Knowledge for policy.
https://knowledge4policy.ec.europa.eu/foresight/topic/dlt4good-scanning_en

ATARCA

15. **Promote educational material, skills, and tools for new forms of anti-rival economic experimentation and technologies**

   a. Massive Open Online Courses (MOOCs), such as those developed as part of the ATARCA project[81], ought to be used to raise awareness of the potential of anti-rivalry and its technical DLT applications for a wider audience.

   b. The education around anti-rivalry and its decentralised applications should not focus purely on technical, trust-minimising architectures but rather on local, interpersonal forms of trust and human oversight.

   c. Existing networks such as CHAISE, EBSI, EU Blockchain Observatory & Forum and INATBA[82] should be utilised in educating and improving skills of practitioners about anti-rival use of DLT and blockchain technology.

16. **Anti-rival mechanisms ought to be experimented with and adapted in accordance with different use cases and contexts of sustainable economy**

   a. In the context of sustainability, tokens should be used to capture anti-rival value by measuring and tracking the environmental effects of different services, firms, organisations, and citizens to incentivise responsible and informed behaviour, e.g., through open CO_2 registries.

   b. Anti-rival tokens like sNFTs signalling reputation and trustworthiness should be applied to solve public good problems like the prisoner's dilemma[83] and to promote greater coordination between actors, e.g., in supply chains and liability issues.

---

[81] An Introduction to Anti-rivalry – ATARCA. (n.d.). https://atarca.eu/courses/introduction-to-anti-rivalry/

[82] Blockchain Strategy. (2023d, February 14). Shaping Europe's Digital Future. https://digital-strategy.ec.europa.eu/en/policies/blockchain-strategy

[83] The prisoner's dilemma presents a situation where two parties, separated and unable to communicate, must each choose between cooperating with the other or not. The highest reward for each party occurs when both parties choose to cooperate: https://www.investopedia.com/terms/p/prisoners-dilemma.asp#:~:text=Understanding%20the%20Prisoner's%20Dilemma&text=The%20prisoner's%20dilemma%20presents%20a,parties%20choose%20to%20co%2Doperate.

ATARCA

c. In an economic context, anti-rival tokens and networks should be utilised to create new institutions. These institutions would promote redistribution and exchange, such as how surplus marketplaces and community currencies could facilitate economic transformations, e.g., a universal basic income.

ATARCA

Image 9. The policy recommendations illustrated on a roadmap for 'Domain 5' © Kirmo Kivelä
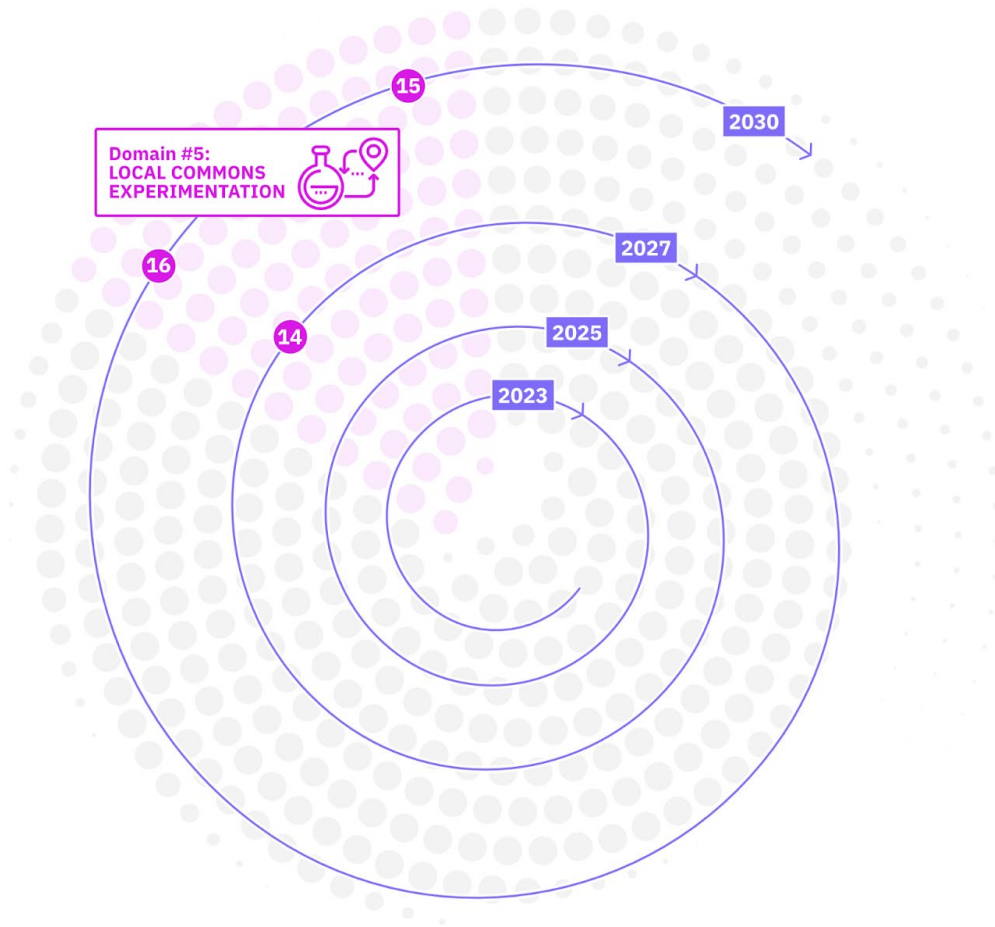
5. Conclusions

A regenerative digital economy, which builds on the recognition of anti-rivalry, is rooted in equitable generation, sharing and governance of data. Considering its economic, political, and social potential, data can be regarded as the most valuable resource of our time. However, so far, we have yet to figure out how to manage data and digital goods in a fair and sustainable way. Resolving this issue is crucial, because how we gather, control, and use data and digital technology affects the very foundations of our societies and economies. Currently, the institutions that gather and control data wield unprecedented power in the business and political realms.

As presented in this publication, the EU is well placed to create the approach and policies for a data economy that supports sustainable prosperity, commons-based participatory economy, and regenerative value creation models. By documenting ATARCA's impact creation process, this publication gives direction and initiatives to enable that goal. Our focus has been on envisioning the implications that greater recognition of the anti-rival nature of digital goods could have for societies, and how its realisation through DLT could be supported. The publication addresses the initiatives and undercurrents, indicating that such momentum could build up. By identifying relevant policy processes at the EU level and building on the research and stakeholder interaction, we formulated recommendations and roadmap to support regenerative digital economy and sustainable societies.

To move forward, the recommendations and roadmap presented in this publication need to be translated into action and tailored to the unique policy context of each community. This requires collective action and collaboration on different levels in our society. Desired changes will be achieved only if the whole of society is equipped to envision and work together towards a better digital future.

ATARCA

6. Annexes

This section is composed of five distinct annexes. The first four cover the policy observatories organised as part of the project and the last one describes participation in ATARCA's policy impact activities.

- Blog post of each of the four observatory sessions, documenting their content.
- Report of participation, which covers the process, methods, and timeline of ATARCA's various impact activities, including the policy observatories, dialogue events, advisory group and communication task force.

Annex 1: First Observatory publication

Policy implications of anti-rival economies and new data policies at hand in ATARCA's first Policy Observatory session

While the global economy is increasingly cantered around data, the data economy and markets remain flawed. We still depend on centuries-old assumptions of scarcity that do not hold for digital goods, which are abundant. The H2020-research project ATARCA suggests that many digital goods are anti-rival by nature: they gain value the more they are shared. Therefore, they fundamentally challenge current economic structures and institutions. Anti-rival goods also pose untapped potential for more sustainable socio-economic structures, such as local cooperatives. However, current economic and political structures and institutions are not prepared to handle anti-rival goods. That's why we gathered around 30 researchers, policymakers, and experts to the first ATARCA Policy Observatory session on 25 November 2021 to discuss these issues.

Three lighting talks provided inspirational openings on fundamentals of anti-rival goods, practical experimentation with them and how the current European policy landscape facilitates this.

ATARCA

Dr Sonja Amadae, the Co-Principal Investigator of ATARCA discussed the project's anti-rival use cases and defined their policy implications. Dr Amadae highlighted how the concept of anti-rivalry can enable data sharing for a greater purpose: for example, environmental sustainability in the food supply chain. She introduced ATARCA's Food Futures Index, a self-curated database that gathers data on food production and its impact on air, water, nutrition, and animal welfare. The FFI supports more informed decision-making on sustainable food consumption by consumers. It also incentivises user contributions to the index through tokens earned for positive impact, which can potentially be turned into environmental certificates, discounts, or subsidies on a community level.

Jordan Hall, founder of multiple disruptive technology companies and decentralised governance expert, underlined the transformational nature of anti-rival goods. He argued that anti-rivalry is not an invented concept but something that exists naturally in reality—just like rivalry and non-rivalry. Despite this, society is not entirely ready to accept anti-rivalry yet; this requires a profound shift. He likened this shift to riding a new type of bicycle: we must accept that we will fall but we must keep trying. The central question is: what does it mean to cultivate anti-rival relationships?

Dr Joachim Schwerin, a Principal Economist in DG GROW, Unit G/3 Digital Transformation of Industry, shed light on the EU Commission policy perspective on the token economy. The decentralisation of data requires a whole new approach to policy and regulation. Emerging Commission policies, such as MiCA (Markets in Crypto Assets), support regulatory sandboxes to foster innovation in distributed ledger technology (DLT) such as blockchain. In a nascent field like this, policymakers must look at local projects, like REC, to further their understanding of the needs that arise. The need for experimentation is also reflected in the emerging understanding of the nature of data, spearheaded by policies such as the GDPR that aim to empower citizens to control their 'own' data. To end, Dr Schwerin called for a need to keep the approach radical as ATARCA moves forward in experimenting with digital assets.

ATARCA

Challenges of the data economy

These insights and the following discussion eased the participants into group work on the current challenges of the data economy:

First, many of the identified challenges gravitated around artificial scarcity, in other words trying to apply existing economic logic to data and other abundant anti-rival goods. Anti-rival resources are unlikely to be governed well with systems used for scarce resources. Paywalls in news sites were raised multiple times as examples of digital product features that artificially create rivalry to fit the existing economic paradigm.

Second, the anti-rival goods connectedness to other digital technologies emerged in the discussion as one of the key points. Anti-rival innovations and decentralisation are tied to other emerging initiatives—like ethical and transparent data, trustworthy AI and privacy preservation techniques. Similarly, anti-rivalry is linked to data portability, missing incentives to share data (while also considering privacy and inclusion of marginalised citizens) and technological investment for these purposes, especially within SMEs. Due to these parallels, one has to look at anti-rivality holistically, not merely focusing on blockchain-specific policies like MiCA.

Third, existing cultural norms, expectations and conceptions of data arise as one of the central challenges. Participants noted that data and tokens are a residue or historical record of action, thereby putting the focus on anti-rivality of the underlying action. Decentralised systems function quite differently from the current centralised ones, making decentralised solutions difficult to implement. This mandates a shift in mindsets. Moreover, even in the Blockchain space, the discourse revolves around Bitcoin and ETH mining, overshadowing new protocols and advancements such as Proof of Elapsed Time.

Anti-rival opportunities to solve the challenges

In the group discussion, many participants focused on how the tragedy of the commons could be alleviated—especially in the case of environmental degradation. Anti-rival attestation systems like open CO_2 registries or markets could increase transparency through decentralised records based on DLT, thereby helping to tackle climate change while empowering local communities in the process.

Some participants considered DLT-solutions an anti-rival technology per se because of its decentralised nature, while others were more sceptical of the whole concept: data-driven business models are founded on scarcity, and data sharing removes the incentives to provide service at all. To what extent can anti-rival thinking challenge monopolies or escape the existing rival practices?

ATARCA

ATARCA

Implications for policies

According to the workshop participants, one of the possible policy implications of anti-rival technologies could be tax reform. As anti-rival economies and non-payment currencies expand, they challenge the current national taxation systems by legitimising the informal economy. The existing policy regimes cannot keep up with disruptive technologies, so governments need to adopt a vision-driven approach to applying DLT rather than purely reactive regulation. For example, they could first identify existing social problems that blockchain can solve, for example by fostering local data commons and currencies and only then building a political strategy to that end. Governments could also prioritise funding (e.g., through Horizon Europe) that focuses on the 'evolvability' of technological systems by the users themselves.

Finally, the discussion illuminated ATARCA's links to existing EU priorities, such as bolstering data economy and data sharing. Better sharing of industrial data within the single market is already one of the main goals of policies such as the Data Governance Act, yet the incentives for such altruistic sharing are still largely missing. This is where the anti-rival goods and economy can play an important role. This was also echoed by J. Scott Marcus, a Senior Fellow at Bruegel, who in his closing remarks drew parallels between anti-rivalry and concepts of conventional economic theory such as network effects and natural monopolies. Traditional economics can teach us a great deal about anti-rival services, such as how to approach the adoption curve, tendency to monopoly and network effects of platform companies.

The ATARCA Policy Observatory brings stakeholders together to explore anti-rival economics

The disruptive potential of anti-rival economics and tokens need to be explored through extensive stakeholder engagement. The ATARCA Policy Observatory sessions aim to create and share policy understanding of anti-rival economics in the context of data economy and tokens. The process consists of four Observatories that address different dimensions of ATARCA's core questions.

The session marked the first observatory session of ATARCA, but the work continues. Through the observatories, we will keep exploring opportunities of anti-rival goods to support building fairer and more sustainable socio-economic structures and identify the required policies and changes for anti-rival governance to foster economic development. The process will result in concrete policy recommendations.

Read the blog post on the ATARCA website: *https://atarca.eu/first-policy-obsv/*

Annex 2: Second Observatory publication

Commons, anti-rivalry, and a sustainable economy – learnings from ATARCA's 2nd Policy Observatory

Web3, blockchain and decentralised technologies are moving forward at extraordinary speeds. These technologies create avenues for positive changes in our economies and can be used to challenge existing extractive economic structures.

Let's begin from our end-goal: what is the economy we strive to build? What does it look like and how does it work? Together, Demos Helsinki and ATARCA are imagining how we can leverage DLTs to build more sustainable and fair economic models and practices.

THE POLICY OBSERVATORY

The 2nd ATARCA Policy Observatory was hosted by Demos Helsinki on June 1st, 2022. The goal was to share perspectives and explore the potential of leveraging decentralised technologies to build fairer and more sustainable economies.

To meet this ambitious goal, we gathered policymakers, researchers, and practitioners from blockchain, anti-rivalry, commons, economics, and web3 backgrounds to imagine and explore where we could and should go with such technologies.

We began the session with an introduction from Johannes Mikkonen from Demos Helsinki, who spoke about how the anti-rival nature of digital goods creates opportunities for alternative futures of the data economy, beyond the false scarcity and competition that define it today. The strength of anti-rival resources, including digital goods, is that they gain value the more they are used. Mikkonen proposed three directions for a new data economy:

- **Regenerative value creation**. We need new value creation models and distribution mechanisms that take into account the societal and communal value of economic interaction and data sharing. We need to create non-extractive models and mechanisms to support collaboration, creativity and collective capabilities.
- **Emancipatory collaboration and economic interaction**. Digital platforms have shown their power in increasing the capabilities of individual actors, and by consequence, contributing to building fairer economies . However we need to guarantee that these new capabilities are enjoyed by everyone and the benefits of them are shared equally.

- **Inclusive economic development**. It is imperative that we identify and conduct new ways of organising and orchestrating our interactions and collaborations. Decentralisation should not come to mean even more predatory forms of privatisation as has been seen with some Web3 initiatives, but instead contribute to wider emancipation and democratisation.

Following Mikkonen's introductory speech, three panellists presented on the potential of DLT-based solutions for social good: James Muldoon, Sandra Uwantege Hart, and Julio Linares. First, James Muldoon, Head of Digital Research at Autonomy, talked about the need for the democratisation of digital platforms. Sandra Uwantege-Hart, an advisor on the use of blockchain in emerging markets and development programming, shared her experiences with using blockchain in humanitarian work. Finally, Julio Linares from Circles UBI talked about community currencies and blockchain-based universal basic income. Sandra Uwantege-Hart, an advisor on the use of blockchain in emerging markets and development programming, shared her experiences with using blockchain in humanitarian work.

Additionally, we had the opportunity to have small group discussions allowing us to exchange not only our excitement and ideas, but also our struggles and setbacks in the world of DLTs and technology. As rapidly as we are moving ahead in this space, many central roadblocks remain. Our discussions opened these tensions.

LEARNINGS AND TAKE-AWAYS

A host of questions emerged from our group discussions:

- How can we rethink money altogether?
- We still depend on real-world ecosystems, so how can we build things in existing structures?
- Since our economies depend on real-world structures, how can we embed technologies within these existing structures?
- We should create new institutions which would facilitate redistribution and exchange. How to do this?
- In building sustainable economies with technology, should we begin or end with policy change?
- How can we keep the powerful and influential people in this space accountable?
- Can anti-rivalry even be codified? And what would this look like (A policy? A practice?)

To reach the futures, we want to create, we need to, before all else, cultivate conditions to allow for this change to be possible. The following requirements emerged from our discussions. In other words, this is what we need to foster:

ATARCA

- To continue testing and pushing for technologies in 'unconventional' environments, it's one way that technologies will organically develop
- Institutional adoption and long-term user adoption of decentralised technologies
- Increased digital literacy wildly in the society
- New legal frameworks
- Political will
- Trust in societal institutions
- A multitude of diverse voices and discussions in the development of DLT solutions
- To talk about our larger values as societies, not only technical values. The conversation is more encompassing than we may think.

These conversations would not have been possible without the honest and inspiring contributions from our panellists. Find out more about Circles UBI and Julio's work [here](#), The UnBlocked Cash project that Sandra created [here](#), and James Muldoon's book Platform Socialism [here](#).

WHERE TO FROM HERE?

The 3rd Policy Observatory will be organised in the Fall of 2022 to go deeper with the recommendations for the future of data economy and markets.

The upcoming session will pave the way to compiling a set of policy recommendations to the European Commission to be published in Spring 2023.

Read the blog post on the ATARCA website: https://atarca.eu/2nd-policy-obser/

ATARCA

Annex 3: The third Observatory publication

What should the European Union do to leverage DLTs for a more fair and sustainable data economy?

Digitalization has created a new resource class: anti-rival resources. This has large ramifications for the data economy and digital markets. While anti-rivalry remains largely unrecognized in public discourse, new commons-based initiatives, and distributed ledger technologies (DLT) are gaining ground. This grassroots development is happening alongside the Commission's efforts to implement digital strategy through initiatives like the Digital Services and Data Governance Act and regulatory framework for blockchain. Yet these policies are still largely based on artificial scarcity, hindering the full potential of digital goods and a functioning data economy.

The third policy observatory session of ATARCA focused on these as part of The European Big Data Value Forum (EBDVF) in Prague, Czech Republic on November 21-23, 2022. With a central theme of *"At the Heart of the Ecosystem for Data and AI"* the EBDVF enabled the Observatory to exploit synergies with wider stakeholders of the European big data community. The goal of the session was to:

- Present the potential of anti-rival digital goods in solving extractive practices of the contemporary data economy
- Explore blockchain and other DLTs as tools to build a more fair and sustainable data economy and present use cases of DLTs for good
- Validate and co-create together the policy recommendations for the EU to move towards a digital economy which serves the needs of society and the planet.

DIVING DEEPER

The event started with a brief introduction to anti-rival digital goods, followed by a commentary on how anti-rivalry relates to the European Data Act by Leevi Saari, a political advisor to MEP Miapetra Kumpula-Natri. He emphasized that anti-rivalry is quite well-aligned with European values and data policies, even if not explicitly recognized. Creating artificial data scarcity leaves the benefits of data in the hands of only a few agents. Mr. Saari noted that with the Data Act, the EU aims to promote a flourishing data economy and to grasp the positive externalities of data for the wider society. This is exemplified in Chapter V of the Data Act and its focus on business-to-government data sharing as a public interest. The anti-rival properties of data is also reflected in other European legislation such as the provisions of data altruism within the Data Governance Act.

ATARCA

Following this, the event explored provisional policy recommendations for anti-rival economics and European data policies through a presentation by Anna Björk, a research area lead at Demos Helsinki. The recommendations contribute to a fair, sustainable, and well-functioning digital economy by:

- Identifying the nature and benefits of anti-rival digital goods; and
- Pointing out the opportunities of DLT and tokens to promote new incentives and mechanisms for anti-rival economy

The recommendations encompass two dimensions in particular:

- New socio-economic approaches, models, and practices; and
- Leveraging DLT for the desired societal changes.

The recommendations are divided into five distinct domains:

1. REGENERATIVE DIGITAL ECONOMY OF THE EU: Incorporating values, conditions, and approaches of a commons-based economy to the digital and economic policies of the EU and experimenting with new governance methods and models for digital economy
2. SOCIOTECHNICAL R&I INVESTMENTS: R&I investments to support inclusive sociotechnical approach to anti-rival economics and technologies
3. ANTI-RIVAL DATA GOVERNANCE: Data governance and regulation to support the incentives, mechanisms, and coordination of anti-rival resources
4. BUSINESS AND VALUE CREATION MODELS: New business models to enable anti-rival compensation mechanisms to incorporate societal benefits in the value creation of digital economy
5. LOCAL COMMONS EXPERIMENTATION: Utilising DLT for decentralised, democratic community collaboration and for promoting grass-roots cooperatives through education and resources

Each domain consists of three to four recommendations for a total of 17 recommendations. The recommendations themselves also have multiple, more specific sub-recommendations within them. At the event, participants could offer more detailed comments on the policy recommendations through the online platform Mural.

ATARCA

DECIPHERING ANTI-RIVALRY

After introducing the recommendations, they were opened up for a panel discussion led by Marten Kaevats, the Co-Founder of GovStack and former National Digital Advisor of the Government of Estonia, and Joshua Davila, a Blockchain Solutions Architect at Settlemint. Davila has been researching novel economic models inspired by cooperatives through the use of decentralised technologies while Kaevats is an expert on open-source and re-usable building blocks for digital governance.

Joshua Davila noted that the mainstream view still treats data as a commodity, which also characterizes the crypto and DLT scene. While DLTs can enable local experiments with real democratic input, they are most often used to exacerbate exploitative market structures and speculative financial asset bubbles. This has been seen most concretely with non-fungible tokens (NFTs) such as Bored Ape Yacht Club which commoditize digital goods that are fundamentally anti-rival by their nature. New concepts and practices within the digital economy are therefore needed to overcome commodification. Kaevats pointed out that embedding anti-rivalry into the data economy requires using scalable open-source data, as exemplified in Estonia and GovStack. Deploying DLTs at a granular level is therefore a key to enabling anti-rival Web3 services.

In terms of the draft recommendations presented, Davila noted the importance of local, bottom up DLT experimentation through cooperatives. The European Union should continue to be more cautious regarding big platforms within the DLT and blockchain context as well, as they have been with the Digital Markets Act. For Kaevats, governance architectures are needed to improve the scalability of DLT solutions. One provocative solution would be to tokenize everything, down to people's shoe sizes, as a way to lessen bureaucracy and enable more seamless services. For Davila, there's a danger to this: tokenization and commodification of everything on the market would have adverse social effects. Moreover, having everything on the chain increases the chance of cryptographic surveillance and discriminatory profiling.

Looking into the future and how EU policies could foster a fair data economy, Kaevats remarked that while DLTs are not necessarily about ownership, digitalisation of rights enables one to bake anti-rivalry into the system. For example, full ownership over one's data would give you power to grant others access to it in a more secure and seamless manner than moving the data to a different server. While this is based on an individualistic concept of data, it can create communities as well, as seen with the MyData movement. For Davila, there's merit to technology neutrality, and the EU regulation should likely not favour a particular technology over another given the volatile nature of DLTs. However, fundamental technology such as zero-knowledge proofs could have an important role to play in the future.

ATARCA

The event was hosted by Johannes Mikkonen and Atte Ojanen from Demos Helsinki. We wish to thank everyone for their participation and will see you at the final policy observatory session during ATARCA final seminar week in March 2023!

Read the blog post on the ATARCA website: https://atarca.eu/3rd-policy/

ATARCA

Annex 4: The fourth Observatory publication

Mapping a pathway towards regenerative digital economy

Digitalisation and data have become the driving forces of our economic system with fundamental implications for human interaction and societal power structures. Yet technological development has created novelties which fit poorly together with institutional structures and governance architecture created in the previous era. Our current economic structures and institutions therefore need a fundamental reform to fully leverage digital, often anti-rival resources.

This tension was at the core of the fourth and final Policy Observatory of ATARCA, which brought together over 30 participants to discuss and scope a roadmap towards a more sustainable and regenerative data economy in Europe. The Observatory, which was held on 9 March 2023 marked the release of ATARCA's policy brief that gathered the project's policy recommendations into an actionable and forward-looking roadmap. The observatory brought together a high-level panel discussion, composed of:

- Mr. Timo Harakka, Minister of Transport and Communications of Finland;
- Ms. Lidia Pereira, Member of the European Parliament, EPP; and
- Dr. Joachim Schwerin, Principal Economist in the Directorate-General Internal Market, Industry, Entrepreneurship and SMEs (DG GROW) of the European Commission.

DIGITAL ECONOMY IN A TRANSFORMATION

To open the session, Mr. Johannes Mikkonen, Senior policy expert on digital governance at Demos Helsinki, introduced the context for the recommendations. He underlined the key premises of ATARCA, namely the anti-rival nature of digital goods; the mismatch between our current economic structures with anti-rival resources; and the potential of distributed ledger technologies such as blockchain to create new incentives and mechanisms for anti-rival sharing. Mr. Mikkonen pointed out that, by solving the efficient allocation of digital goods and their benefits in a socially optimal and equitable way, we can create opportunities for a more regenerative digital economy - an economy which would be ecologically and socially sustainable.

To illustrate what a regenerative digital economy could look like, Mr. Mikkonen introduced three shifts in the realms of new economic paradigm, new forms of economic collaboration, and novel approaches to value creation. The first shift, *sustainable prosperity*, refers to the emerging movement challenging the gridlock of growth-based models on our economic system. To mitigate and omit the socially and environmentally adverse outcomes of only using GDP as an indicator, we should instead utilise anti-rivalry to focus on prosperity as different from economic growth. The second shit, *commons-based participatory economy* would mean a more effective utilisation of digital technologies in support of commons-based economic governance as well as more participatory and inclusive economic interaction. The third shift, *regenerative value creation models* mean creating new incentives and mechanisms for capturing value from data and digital goods, such as peer-to-peer and freemium as business models. This can help to lessen the social and economic inequalities datafication of society has contributed to.

POLICY ROADMAP

The recently published policy recommendations and roadmap were specifically created to advance the above-mentioned shifts towards regeneration. As they consist in a total of sixteen recommendations with subcategories, Mr. Mikkonen focused on explaining the five domains, under which the recommendations are clustered together. In addition, he highlighted one recommendation for each domain. The domains are complementary to each other in that they focus on different development areas with interlinkages:

1. Regenerative economy agenda of the EU
2. Sociotechnical R&I investments
3. Anti-rival data governance
4. New business and value creation models
5. Local commons experimentation

ATARCA

The individual recommendations indicate which kinds of actions we consider to be of key importance in the renewal of our economies to foster their digital potential. First of all, as a paradigm level change, recommendation 2 states that "anti-rivalry should be recognised and embedded in economic visions and policies of the EU in a cross-sectoral approach". More specifically this means understanding and approaching anti-rivalry broadly as a perspective connecting data commons, public goods, cooperatives, open-source resources, and sustainability across policies. On the other hand, at the policy level it is crucial to steer our R&I investments in a way that would prevent public funding programs from "falling into techno-solutionism and instead promote inclusive socio-technical perspectives" as recommendation 4 states.

In the context of anti-rival data governance, Mr. Mikkonen brought up the need to "develop commons-based data governance such as data commons and unions", and to "expand the regulatory efforts around data commons such as Open Data Directive into the private setting to support sharing of data for the public good" as per recommendation 7. Moreover, in support of new business and value creation models, it is important that "public institutions should promote and support digital public goods and digital open commons", as well as encourage the EU to "promote digital open commons by establishing a 'European incubator for digital commons'" as per recommendation 11. And finally, indicating the need for experimentation, Mr. Mikkonen emphasised the potential of steering "DLT pilots and regulatory sandboxes towards community experimentation with platform cooperatives and democratic DAOs" in accordance with recommendation 17.

DISCUSSION ON THE FUTURE

Dr. Schwerin from the European Commission started the panel discussion by remarking that DLT is not just any technology, but something that for the very first time has enabled a trustworthy and secure interaction between individuals and collectives all over the globe. The European Commission has backed DLTs such as blockchain since 2015 in an opportunity-driven fashion by declaring it as one of the breakthrough technologies supported across policy fields. As such, we should not be misguided by the fact that DLT started in the financial domain but also recognize the wider economic benefits of the technology for European citizens and SMEs. Moreover, DLT has an inherent social dimension to it because of its decentralised nature, which is tied with the history of Europe. This is opposed to the top-down approach that we have seen in many other parts of the world, currently driven by big tech companies that extract data from individual users. From this perspective, DLT and blockchain is not only an enabling technology for economic opportunities, but it is also a social exercise on data ownership that is fully embedded in the European policy framework on data.

Minister Harakka provided unique insights from the perspective of a sitting minister, having recently written a book "Data Capitalism in the World of Crisis". He emphasised the need for a holistic approach to blockchain technology and policies, looking beyond financial instruments to more comprehensive data sharing solutions. The minister highlighted that trust, transparency and security always come first for citizen acceptance of these technologies and stressed the need for anti-rivalry in understanding the shift to web 3.0. Tokenization will likely be developed alongside traditional solutions, and interoperability is key for innovation and competition in data economy, as well as for building resilience within digitalized societies. Minister Harakka also noted the importance of digital commons and open standards as a way of promoting more democratic and citizen-driven development of the data economy.

Ms. Pereira highlighted the importance of Europe taking a lead in the digital revolution that is currently taking place through decentralisation. Europe cannot afford to be left behind on the web 3.0 as in previous digital revolutions, necessitating investments into technology and an innovation-friendly environment. This means a balanced legislative framework that considers proportionality, responsibility, and coherence of the regulation, especially from the perspective of SMEs. Ms. Pereira saw the need to focus on the underlying technology itself, blockchain, rather than on cryptocurrency and the recent scandals surrounding it. In fact, blockchain can be utilised as a solution in various industries, including financial and banking services, even down to modernising national tax systems if done correctly.

ATARCA

The ensuing discussion focused on the intensifying geopolitical competition surrounding digital and blockchain technologies and the role of anti-rivalry in the midst of it. The panellists emphasised the need for the European Union to enhance its common voice and soft power in the international system, in which regulations such as MiCA can play an important role. Fostering better transatlantic relations and building stronger alliances and partnerships around the world on digital commons and flow of data were also seen as positive pathways.

The event was concluded by Dr. Anna Björk, research area lead at Demos Helsinki, where she focuses on the societal impact of emerging digital technologies. She reflected on the past two years of the ATARCA project and its policy observatory process, which was designed to support the interpretation of the project's research results from the perspective of digital and economic policies of the European Union. Dr. Björk noted how the discourse and audience for anti-rivalry and digital economy has gained more ground during this time, towards a greater recognition of anti-rival economic thinking. Finally, she gave an overview of recent and future activities at Demos Helsinki, which seek to further reflect and develop ATARCA's findings and the concept of regenerative digital economy. We wish to wholeheartedly thank everyone involved in the Policy Observatory process. *Read the blog post on the ATARCA website:* *https://atarca.eu/4th-policy/*

Annex 5: Report of participation

This publication is the result of the impact process of ATARCA. The findings are conducted in dialogue and co-creation with a wide range of stakeholders from academia, public sector, industry, and civic organizations aiming to ensure the results are exploited and implemented efficiently and they are fed into the existing policy processes.

The policy recommendations are linked into the existing and future policy processes and discussions of the European Union aiming to have an impact on the strategy, policy and regulation of the European Commission regarding DLT, blockchain and inclusive data economy taking into account the anti-rival nature of digital goods. The process has been linked to the on-going discussion and public debate on the European Union's data and digital policies as well as public discussion on Web3, NFTs etc. The concepts and results have been discussed with various stakeholders such as a) policymakers and civil servants (EC representatives as part of policy opportunities scanning) b) technology developers via e.g., Finnish AI 4.0-program c) researchers e.g., in H2020 Token -project d) civil society such as Civic Software Foundation.

This chapter describes the stakeholders and organizations that have participated in the co-creation process:

1. ATARCA consortium partners
2. Members of ATARCA Policy Advisory Group
3. Participants ATARCA Policy Dialogue sessions
4. Participants in the ATARCA Policy Observatories
5. Policy impact and communication task force

1 ATARCA consortium

Demos Helsinki has carried the main responsibility of this publication, but all ATARCA consortium partners have contributed to the actual policy recommendations and roadmap. Demos Helsinki organised the workshop for the research consortium on 9th November, where policy recommendation drafts were elaborated together.

In addition, all ATARCA use cases conducted learnings regarding policy changes and impact. Those learnings and reflections were incorporated into other policy recommendations during autumn 2022.

ATARCA

Demos Helsinki also gathered comments and feedback for the publication from the ATARCA consortium during 15.-27.2.2023.

2 ATARCA Policy Advisory Group

Policy advisory group include external experts

- Rainer Kattel (Deputy Director and Professor of Innovation and Public Governance at the UCL Institute for Innovation and Public Purpose (IIPP));
- Primavera de Filippi (researcher at the National Center of Scientific Research (CNRS) in Paris, a faculty associate at the Berkman Klein Center for Internet & Society at Harvard University, and a Visiting Fellow at the Robert Schuman Centre for Advanced Studies at the European University Institute);
- Katja Bego (Principal Researcher and data scientist in Nesta's technology futures and explorations team;
- Matthew Schutte (Philosophical, Strategic and Administrative Co-Conspirator at The Bateson Institute); and
- Michael Zargham (founder and CEO of Blockscience, Affiliated Researcher Wienna Research Institute for Cryptoeconomics).

The group has supported ATARCA to meet its goals in the best possible ways and has created direct, open, deliberative, and guiding connections between the project researchers and board members. Especially the board has had a role in supporting the policy impact work: help identifying the right leverages to policy impact. The collaboration has been organized through the sessions below. In addition to that advisory board members have done collaboration informally with project researches due e.g. having keynotes in the final seminar.

ATARCA

Table 3. ATARCA's Policy Advisory Group meetings.

| Session	Goals	Agenda
Kick off the board 23.6.2021	Get to know each other Shared understanding of ATARCA Discuss the impact goals and setting of ATARCA	Welcome, Ville Eloranta, PI of ATARCA- Introduction round of the board members Introduction to ATARCA, Esko Hakala Policy impact of ATARCA Impact objectives Policy observatory process What is advisory board and how it works Discussion: policy impact and setting of ATARCA
ATARCA Prototype Evaluation w. Policy Advisory Board 9.9.2021	Validate and elaborate ATARCA business models prototype with board	Introduction to ATARCA business model prototype, Martin Moravek, Streamr Commenting and discussing the prototypes in Miro-board.
Policy Advisory Board Meeting on the use cases, 1.2.2022.	To discuss the latest results of ATARCA To get feedback and comments on the use cases of ATARCA	Welcome Ville Eloranta, PI of ATARCA, Aalto University Project update and introduction to the use cases Esko Hakanen, Aalto University Presentations of ATARCA pilot use cases Streamr Acknowledgment Token, Martin Moravek, Streamr Barcelona Green shop -case, Sofia Gonzalez, Novact Food Futures Case, Sonja Amadae, University of Helsinki General discussion on the use cases Policy observatory, Greetings from the first session and next steps, Demos Helsinki
Online contribution to ATARCA policy recommendations (December 2022)	To validate, elaborate and co-create ATARCA policy recommendations	Draft policy recommendations were shared in Miro for advisory board members to comment online during two first weeks of December 2022.

ATARCA

3 ATARCA Policy dialogue sessions

Part of the impact creation, Demos Helsinki has organised five policy dialogue sessions, where ATARCA results have been represented and discussed. The insights have been utilised in this publication and created understanding of which results resonate within different stakeholders.

1. The first session was held at the Untitled festival in September 2021 (M6; online) with about 40 participants and reaching the whole festival audience with 200 participants bringing together people to imagine a social agenda for transformation of data economics.

2. The second session was organised in the Responsible AI Forum in December 2021 (M9, transferred from live event to online due to the Covid-19 situation) brought together members of industry, civil society, government, and academia to discuss project approaches with the perspective of responsible use of AI and encouraged exchange between research and practice.

3. The third session was held 31.5.2022 (M14; online) as part of BDVA Data Week 2022. The session was titled New Directions for Data Economy - Potential of Anti-rival Digital Goods, presented by Atte Ojanen, Esko Hakanen and Markku Nousiainen from ATARCA consortium. 78 participants signed up for the session and reaching the audience of 726 participants from the industry, academia and civic society took part in the whole Data Week.

4. The fourth session was held 10.-11.10.2022 in Tallinn Digital Summit, where ATARCA concepts and results were discussed with several public sector digitalisation actors such as GovStack, GIZ, Digital Impact, NIIS, and Tallinn University of Technology.

5. The fifth session was organized in a conference organised by the OE-A (Organic and Printed electronics association) in the University of Tampere on 19.10.2022, where ATARCA results and approach was presented to an audience of 50 people including representatives from the academy and technology industry.

ATARCA

4 ATARCA Policy Observatories

In order to gain a comprehensive understanding of the concept of anti-rivalry from broader societal and political perspectives, ATARCA's impact creation activities included four policy observatory sessions. The policy observatories were intended to collect insights and inputs for ATARCA's project team on their work, while also disseminating the project's approach and findings to the broader audience.

Image 10. ATARCA policy observatory process.
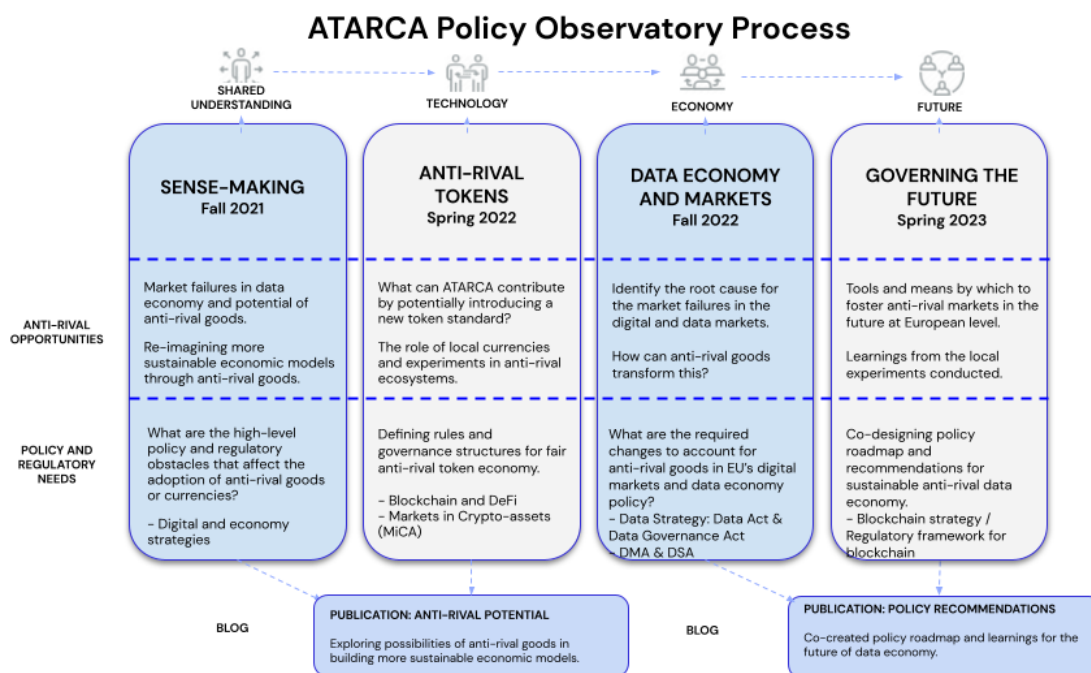
The first ATARCA policy observatory took place on 25 November 2021 (M8; online), entitled Anti-rival economies and new policies for digital society. The invited speakers included S.M. Amadae (the University of Helsinki), Jordan Hall (DeepCode), and Joachim Schwerin (the European Commission). The participants (n = 30) included researchers, technical developers, governance experts, policymakers and advisory board members, who had a chance to take part in the discussion both in the main session and breakout rooms. The results of the event were published in ATARCA website and supported redefining and validating ATARCA approach. Observatory supported the ATARCA planning and identification of synergies with other on-going initiatives and opportunities, both in public and private sectors

Aims of the session were i) t**o produce a shared understanding** of challenges of the current data economy; ii) t**o discuss** the potential and opportunities of anti-rival thinking to solve the challenges and foster fair and sustainable societies, not based on artificial scarcity and iii) **to identify** the policies and changes needed to put in place to grasp the opportunities of anti-rival systems.

Agenda

> **14:30** Introduction, Demos Helsinki
>
> **14:45** Lightning talks and discussion
>
> > - S.M. Amadae, the University of Helsinki
> > - Jordan Hall, DeepCode
> > - Joachim Schwerin, the European Commission
>
> **15:25** Group work
>
> **16:30** Discussion
>
> **16:45** Comment by J. Scott Marcus, Senior Fellow at Bruegel

ATARCA second POLICY OBSERVATORY was held online on 1.6.2022. The session focused on commons, anti-rivalry, and sustainable data economy with presenting ATARCA's economic vision as an introduction, following with panel discussion with James Muldoon, Sandra Uwantege Hart, and Julio Linares, each of them opening up a new perspective to the topic. 37 participants discussed the topic in small groups after the panel. The aims were i) to produce a shared understanding of the potential of DLTs such as blockchain for more sustainable and fair economic practices; ii) to learn of the challenges and opportunities of DLTs via practical cases; iii) to identify the policies and changes needed to fostering the desired changes in our economic practices.

Agenda

> **14:00** Introduction, Demos Helsinki
>
> **14:20** Panel discussion with Q&A
>
> > - James Muldoon
> > - Sandra Uwantege Hart
> > - Julio Linares
>
> **15:30** Group discussion
>
> **15:50** Closing remarks
>
> **16:00** Thank you!

ATARCA

ATARCA third POLICY OBSERVATORY was held in Prague in the European Big Data Value Forum (EBDVF2022) 23.11.2022. The observatory discussed the initial policy recommendations for what the European Union should do to leverage DLTs for a more fair and sustainable data economy. In addition to ATARCA researchers, the session included the keynote from Leevi Saari, special advisor from the European Parliament and panel discussion with *Joshua Davila, Blockchain solution architect from Settlemint and Marten Kaevats, Co-Founder of Gov-Stack and former National Digital Advisor of the Government of Estonia. Participants (n = 23) got a chance to comment and ask questions regarding the policy recommendations and the topics of the panel.* Aims were i) to validate together the policy recommendations for the EU to move towards a digital economy which serves the needs of society and the planet; ii) to discuss the desired directions of the European Union's data and digital policies and iii) to produce a shared understanding of the potential of DLTs such as blockchain for more sustainable and fair economic practices.

Agenda

> **16:00** Introduction
>
> **16:10** The European Data Act - supporting a fair and innovative economy
> > *Leevi Saari, special advisor of data economy of Miapetra Kumpula-Natri, Member of European Parliament representing Finland, S&D Group*
>
> **16:20** Policy recommendations for anti-rival economics
> > *Anna Björk, research area lead, Demos Helsinki, Finland*
>
> **16:30** Discussion on the recommendations
> > *Joshua Davila, Blockchain solution architect, Settlemint*
> > *Marten Kaevats, Co-Founder of Gov-Stack and former National Digital Advisor of the Government of Estonia*

ATARCA fourth POLICY OBSERVATORY was held online in the context of ATARCA's final seminar week on 9.3.2023. It was titled Roadmap for a Regenerative European Digital Economy: What should Europe do to create conditions for sustainable prosperity and regeneration in the digital economy? The session explored how key EU policies such as Data Act and Data Governance Act could accommodate economic activity based on sharing of anti-rival digital goods. The policy roadmap has been developed by Demos Helsinki through ATARCA real-life use cases that utilise distributed ledger technology to create more commons-based economic mechanisms. Presentation of the roadmap was followed by a high-level panel discussion covering the perspectives from the European Commission, Parliament, and national context, including questions by the audience (n=33).

Agenda

14:00 Welcome!

14:05 Roadmap and recommendations to regenerative digital economy

Johannes Mikkonen, Senior Policy Expert, Demos Helsinki

15.30 Panel discussion

- *Timo Harakka, Minister of Transport and Communications, Finland*
- *Lídia Pereira, Member of the European Parliament, EPP*
- *Joachim Schwerin, Principal Economist in the DG GROW of the European Commission*

16.00 Q&A for panellists - opening the floor for the audience & pre-planned questions

16.15 Wrapping up - the work continues

16.30 END

5 Policy Impact and Communication Task force

Internal policy and communication task force has coordinated and supported the policy impact work. Task force met monthly. As the results of these activities supplemented with research collaboration, ATARCA has successfully identified the needs and routes for the transformation it is seeking for, provoking large interest, including several blog posts, a quarterly newsletter, and on-going social media efforts, altogether xx readers. Contribution to the on-going discussion related to e.g., WEB3, NFTS, DLT and European unions' data and digital policies support exploitation of the project results.

ATARCA