THE EUROPEAN UNION'S SCIENCE, TECHNOLOGY AND INNOVATION DEVELOPMENT POLICY TO RESPOND TO THE CHALLENGES OF THE NEW CONTEXT

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***Summary**:*

In the context of a rapidly changing world due to global challenges such as the COVID pandemic, geopolitical competition among major powers, the Russia-Ukraine conflict, and, especially, the explosion of the Fourth Industrial Revolution has greatly affected the development of countries and regions around the world. Meanwhile, the European Union (EU) is lacking the motivation to innovate and facing many environmental and social challenges. In addition, the EU is lagging behind other countries, specifically: Losing to the United States in knowledge-based industries and the number of high-tech human resources; Being surpassed by Japan and South Korea in the high-tech product market; Facing great competitive pressure from China and India, which have increased in high-value-added industries based on cheap human resources. Recognizing this new context, the EU has implemented many measures to develop science, technology and innovation (STI). The EU's experience is a valuable suggestion for Vietnam in its implementation of STI development policies.

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1. Introduction

In the current context, where numerous factors are influencing national development goals, countries - particularly those in developed regions such as the EU - are increasingly relying on the driving force of science, technology and innovation (STI) to achieve these goals. Among these, STI development policy plays a fundamental role. The EU's experience in implementing STI policies in this challenging global environment will offer valuable lessons for Vietnam in building and implementing policies to promote STI, thereby contributing to the national development process.

2. Identifying some factors of the new context that affect the development of STI in the EU

Currently, the EU is facing challenges stemming from both international and internal factors. These factors have had certain impacts on the EU's development process, particularly in the field of STI, specifically:

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2.1. International context

- The Fourth Industrial Revolution is having a profound impact on the EU's STI. Advanced technologies such as artificial intelligence (AI), big data, autonomous robots, the Internet of Things (IoT), and blockchain are not only changing the way EU countries produce and consume but also reshaping the processes of research and innovation, creating new opportunities and major challenges for EU technology and innovation policies.
- The Russia-Ukraine conflict has had a strong impact on the EU's STI development strategies. These impacts include increased spending on defense and cybersecurity, adjustments to technology supply chains, changes in the direction of international cooperation in research, and increases in clean and sustainable technology initiatives. Despite these challenges, the conflict also opens opportunities for the EU to increase its autonomy and innovation in key technology areas.
- Geopolitical competition among major powers, particularly between major countries such as the US, China, Russia, and emerging economies, has a profound impact on the EU's STI. This not only creates challenges in maintaining global competition in high-tech sectors but also pushes the EU to adjust its technology and research policies to reduce dependence on other countries and protect its interests in strategic technologies. Despite many challenges, this competition also opens opportunities for the EU to increase investment in innovation.
- The COVID-19 pandemic has significantly accelerated innovation and digital transformation in the EU, particularly in healthcare, digital technology, and sustainable manufacturing. However, it has also created a series of challenges, including supply chain disruptions, heightened cybersecurity concerns, and the need to upgrade the digital skills of the workforce. The EU has used the pandemic as an opportunity to drive innovation, advance digital transformation, and build a more sustainable and secure digital economy.
- Climate change also has a profound impact on the EU's STI, driving innovation in areas such as renewable energy, low-emission technologies, sustainable agriculture, and smart cities. At the same time, it also poses major challenges for industries and supply chains. However, through international cooperation, scientific research, and investment in new technologies, the EU is leveraging STI to address these challenges and create a sustainable future.

2.2. Regional context

- The EU's lagging behind major competitors such as the United States, China, and other Asian countries in STI is a growing concern. While the

EU remains strong in many areas such as renewable energy, pharmaceuticals, and environmental technology, it faces challenges in maintaining and enhancing its STI position amid significant disruption from other economies.

- Population aging presents challenges and opportunities for the EU's STI policy. While aging may create problems for the workforce and R&D spending, it also drives the development of technologies and services for older people, and it requires innovation policies focused on assistive and automated technologies. To stay competitive, the EU has increased investment in strategic areas such as medical technology, elderly care, automation, and workforce retraining.
- The EU Green Deal is not only an environmental protection strategy but also a major driver for the strong development of STI. By investing in clean technologies, renewable energy, green transport, smart manufacturing, and sustainable business models, the EU is opening great opportunities for innovation and sustainable economic development. EU countries and businesses must seize this opportunity to foster technological advancements while contributing to reducing greenhouse gas emissions.

3. European science, technology and innovation development policy

3.1. Objectives and targets of the policy

3.1.1. Objectives

Throughout its history, the EU's STI development policies have undergone a major change from focusing on cooperation in basic science to aiming at developing a knowledge-based economy, and in the current context, the goal of the EU's STI development policies is to create a sustainable and digital economy. These changes reflect the EU's sensitivity in adapting to global challenges while leveraging STI to drive economic growth, improve living standards, and protect the environment.

3.1.2. Policy Targets

The history of the development of the EU's STI policy shows that there have been changes in the target audience of the policy, specifically: before 2010, the EU's STI development policies focused mainly on research institutes and universities. Since 2010, the EU's STI development policies have expanded include a diverse range of stakeholders, including small and medium enterprises (SMEs), universities, research institutes, the public sector, industry, consumers, and the social community.

3.2. EU's STI Development Tools and Measures

3.2.1. Reforming the appropriate environment for STI development

To develop STIs in the current context, the EU has reformed its environment to better support STI development, specifically by:

Implementing new legal tools

- *The General Data Protection Regulation (GDPR),* which came into effect in May 2018, has created a unified legal framework to protect the privacy and management of personal data for EU citizens. GDPR requires companies to notify about the collection and use of data and request explicit consent from users. Strict security measures and the requirement to report data breaches within 72 hours of detection are also important elements of GDPR. Companies that do not comply can be fined up to 20 million EUR or 4% of their total annual global turnover. The GDPR not only protects EU citizens but also sets a global standard for data protection *(European Parliament, 2016);*
- *The Artificial Intelligence Act (AI Act):* proposed in April 2021 and completed by the end of 2023, sets out the world's first legal framework for artificial intelligence (AI). To ensure compliance, each EU member state will establish an AI supervisory authority, and a European AI Council will coordinate and monitor enforcement, with fines of up to €20 million or 4% of the global turnover of the offending company *(European Parliament, 2024);*
- *The Data Act (Data Act):* proposed in February 2022, is a key part of the EU's data strategy, aiming to create a single data market and develop the efficient use of data across the region. The Act also supports interoperability and data portability between different systems and providers, making it easier for users to switch services and ensuring that data can be used continuously without technical obstacles *(Federico Casolari et al, 2023);*
- *The Cybersecurity Act (CSA)*: proposed in September 2022, is an important step towards ensuring the security of digital products such as software and hardware. The CSA requires manufacturers to integrate cybersecurity measures into all stages of the product lifecycle, from design and development to maintenance. Manufacturers must promptly report security vulnerabilities and cybersecurity incidents, increasing transparency and safety for users *(Jennie Clarke, 2024);*
- *EU Digital Services Regulations,* including The Digital Services Act (DSA) focus on creating a safer online environment by imposing strict liability and accountability rules on online platforms. The DSA requires these platforms to protect users from illegal content, disinformation, and other online abuses *(EBU,2023).* The Digital Markets Act (DMA) aims to maintain fair competition and prevent monopolistic practices by large digital platforms, often referred to as "gatekeepers". The DMA sets rules to prevent companies from abusing their dominant position to eliminate or

weaken smaller competitors. This includes measures such as banning exclusive agreements and requiring equal access to services and data for competitors and users *(Jones Day, 2022);*

- *Cybersecurity regulation:* aims to improve cybersecurity and the ability to respond to cyber threats, ensuring the safety of critical infrastructure and citizens' data. One of the key initiatives in this policy is the Cybersecurity Directive (NIS2 Directive), adopted in 2016 and updated in 2020. The NIS2 Directive requires member states to establish national cyber security agencies, improve cybersecurity capabilities, and develop cooperation between member states and international organizations *(European Parliament, 2022).*

Building a scientific advice mechanism: The European Commission (EC) established the Scientific Advice Mechanism in 2014. At the outset of the development of the scientific advice mechanism, the EC decided to establish a High - Level Group of Scientific Advisors, which provides expert scientific advice for decision-making. Following the establishment of the Main Scientific Advisory Group, the EC established the European Academy of Sciences Scientific Policy Advisory Group in December 2016. With financial support from the Horizon 2020 research and innovation framework program, based on the Alliance of the five largest European Academies of Sciences, the role of the European Academy of Sciences Scientific Policy Advisory Group is to provide independent, state-of-the-art scientific advice for EU decisions (*Europarl, 2016*).

Providing STI policy support services in Member States: In March 2015, the EU proposed the establishment of a policy support service around the STI Framework (*González, S.; Kubus, R.; Mascareñas, J, 2018*). Providing innovation policy guidance and practical support from the regional level to Member States and countries participating in the Framework. This aims to improve and enhance the level of STI decision-making in EU Member States as a whole, as well as the performance of the STI system. Annually, through the publication of the launching notice, the countries concerned propose their specific wishes in improving STI policy design, policy implementation, and improving the quality and efficiency of the innovation system. The EC has established an expert group to provide policy support that implements three types of services: The first type is to provide peer review and special support; The second type is to provide a platform for mutual learning and experience sharing for applicant countries voluntarily; The third type is follow-up support for countries that have received policy support services.

Establish STI principles in decision-making and establish feedback mechanisms on the effectiveness of the implementation of regulations. To improve the effectiveness of decision-making in developing STI, the EU has developed and implemented the “EU Innovation Principle” which means that when the Commission prepares to implement new initiatives or plans and

develops relevant policies and legislation (*EC, 2022*), it must always be based on whether it supports and benefits STI or not. It must ensure that relevant legislation creates the best possible conditions for innovation development. From setting the initial legislative agenda to developing regulatory legislation and then to final implementation, the EU STI principle runs through the entire decision-making process. To avoid the outcome of implementing laws and regulations that are contrary to their original purpose, the EC decided to establish a feedback mechanism on laws and regulations that allow businesses and innovative organizations to cooperate with law and regulation enforcement agencies.

Improving the regulation of innovation investment, in February 2016, the EC officially issued the document "Better regulation of innovation investment at EU level". The EC drafted this document with comments and recommendations from EU Member States, innovation organizations, and industry, as well as conducting case studies on different sectors *(Europarl, 2016).*

3.2.2. Promoting private sector investment in R&D and innovation activities

Increasing funding from the EU budget, the EU has continuously increased the budget for STI programs through many frameworks, the most prominent of which are Horizon 2020 and Horizon Europe for 2021-2027. With a total budget of EUR 80 billion and EUR 95.5 billion respectively, these programs have created a large source of funding for STI. In addition to these two major funding programs, the EU also implements a series of other funding programs such as the European Innovation Council (EIC); Digital Europe Programme; European Green Deal; European Research Infrastructure Consortia (ERIC); Science Infrastructure Development Programme (SIP) (see Table 1).

Table 1. EU-level programmes funding for R&D

Programmes	Time	Budget (EUR)	Main activities
Horizon 2020	2014 - 2020	80 bil. EUR	Promote research excellence, address societal challenges, and enhance the competitiveness of European industry.
Horizon Europe	2021 - 2027	95,5 bil. EUR	Continue to support research and innovation, focusing on strategic areas such as climate change, health, and digital technology.
European Innovation Council (EIC)	2021 - 2027	10 bil. EUR	Support start-ups and SMEs with innovative ideas through funding and mentoring.
Digital Europe Programme	2021 - 2027	7,5 bil. EUR	Strengthen digital capabilities in industrial and social sectors, including artificial intelligence, cybersecurity, and digital technology.

Programmes	Time	Budget (EUR)	Main activities
European Green Deal	2019 - nay	Approx. 1 bil. EUR for green sectors R&D	Achieve carbon neutrality by 2050, supporting research and development in green technology, renewable energy, and sustainable urban development.
Science Infrastructure Development (SIP)	2021 - 2027	6,5 bil. EUR	Build and upgrade research infrastructure in the fields of green technology and digital transformation, providing modern equipment for research institutes.

Source: Compiled by author

Promoting private sector investment in STI, the EU has recognized that its STI ecosystem is lacking the private sector financing instruments, especially from the perspective of venture capital, and venture investment in EU's STI. Therefore, the EU is implementing measures to ensure the realization of innovative ideas, attract investors from across Europe, and better leverage the potential of the common market to facilitate innovative finance and private sector investment in STI activities, specifically: *Promoting the role of the European Fund for Strategic Investments* in promoting innovative investment. The European Fund for Strategic Investments was established in July 2015 by the EC and the European Investment Bank - EIB (*EIB, 2022*). *Development of new financial instruments:* The "EU Finance for Innovators" (InnovFin) program is a new financial instrument developed by the European Investment Bank - EIB in collaboration with the EC within the framework of the "Horizon 2020" program. *Establishment of a pan-European venture capital fund*: The EU proposed in 2015 the establishment of a pan-European venture capital fund (VentureEU). The fund will mainly provide finance to SMEs, and growth-stage enterprises in the fields of information and communications technology, digital, life sciences, technology, health, natural resources, and other sectors *(EC, 2018).*

3.2.3. Developing modern research infrastructure

Building and upgrading research facilities: The EU has invested in laboratories equipped with advanced equipment to support research in health, energy, and information technology. In addition, the EU has developed large data centers and high-tech infrastructure to support the storage and analysis of research data (see Table 2).

Table 2. EU programs investing in research infrastructure

Programmes name	Time	Outcome
Horizon 2020	2014 - 2020	6 bil. EUR for technology and equipment, supporting more than 1,800 research units, and more than 25,000 projects.

Horizon Europe	2021 - 2027	10 bil. EUR for technology and equipment, supporting more than 1,000 new research units, and 3 billion EUR for infrastructure.
European Innovation Council (EIC)	2021 - 2027	3 bil. EUR for technology and equipment, supporting more than 1,500 mil. EUR for about 1,000 startups.
Digital Europe Programme	2021 - 2027	3 bil. EUR for digital technology infrastructure, supporting digital technology development for businesses.
Science Infrastructure Development (SIP)	2021 - 2027	Improving more than 200 research units, providing modern equipment.

Source: Compiled by author from the Program evaluation reports

Establishment of the European Research Infrastructure Consortia (ERIC)

ERIC is a research collaboration established by Council Decision (EC) No 723/2009 of 16 July 2009. ERIC is designed to create and manage innovative research infrastructures, serving the European and global research community. Below is a table of representative ERICs, their budgets, and figures related to their research activities (see Table 3) (*EC, 2024*).

Table 3. Areas of ERIC

ERIC name	Research Area	Place	Budget (EUR)	Outcome
European Spallation Source (ESS)	Nuclear Physics	Lund, Sweden	1,8 bil.	Building infrastructure, supporting 500 researchers annually
European XFEL	Materials Science, Medicine	Hamburg, Germany	1,3 bil.	Providing X-ray sources, supporting 300 researchers annually
European Solar Telescope (EST)	Solar Astronomy	Canary Islands, Spain	500 mil.	Study the structure of the Sun, supporting 200 researchers
E-ELT (European Extremely Large Telescope)	Astronomy	Atacama Desert, Chile	1,5 bil.	Building a very large telescope, supporting 400 researchers
Graphene Flagship	Advanced Materials	Berlin, Germany	1 bil.	Study graphene, supporting 1,000 researchers
Human Brain Project ERIC	Neuroscience	Geneva, Switzerland	1,2 bil.	Study the human brain, supporting 800 researchers.

Source: Compiled by author from the ERIC report

3.2.4. Promoting the development of an open STI ecosystem

The EU has taken several measures to strengthen the support services for the development of an open STI ecosystem, such as:

Establishing the European Innovation Council, in recent years, the EU has integrated innovation elements into its programs and policies. The most prominent initiative is to encourage the participation of high-quality enterprises in the "Horizon 2020" and "Horizon Europe" programs. At the same time, the EU acknowledges that existing innovation support mechanisms are not responsive to enterprises, especially SMEs, due to the increasingly shortening innovation life cycle. Although the EC continues to channel most of its support for research and innovation through Horizon Europe and the structural funds, the EC's innovation policy toolkit has expanded over the years to cover the entire innovation chain. This has led to the establishment of the European Innovation Council in 2021 with a budget of €10 billion over seven years. The EC has adopted a New European Innovation Agenda by 2022 to put Europe at the forefront of the next wave of "deep tech" innovation. The Agenda outlines concrete actions to improve access to finance for European startups and scale-ups; to test new ideas through "Sandboxes"; help create "regional innovation valleys", including lagging regions; attract and retain talent in Europe; and improve policy frameworks.

Establishing a reserve fund for "certified excellence" research plans, establishing a reserve fund for "certified excellence" research plans not only helps research and innovation to have more investment channels but also mobilizes all elements in the innovation ecosystem to participate in interaction, raise awareness of the flow of funding sources, and create new investment opportunities for them, thereby maximizing the impact of innovation investment. On the other hand, through the "Certification of Excellence", EU Member States can more accurately and effectively select high-quality research projects that are expected to be funded by investment funds or regional resources, and benefit from future innovation results. Within the framework of the "Horizon Europe" research and innovation funding program for 2021-2027, the EU continues to improve the quality and impact of the "Certificate of Excellence" research program group and significantly strengthens its role in investment and structural fund programs.

3.2.5. Promoting international cooperation in the field of STI

To develop STI in the current context, the EU believes that it is necessary to strengthen international cooperation in this field. In 2021, the EC announced the "Global Approach to Research and Innovation" strategy (*Europarl, 2023*), through which the EU has established many programs and initiatives to develop international cooperation and to respond to global challenges. This strategy aims to maintain openness in research and innovation cooperation, develop an equal playing field and reciprocity based on fundamental values, and strengthen bilateral and multilateral partnerships to address green, digital, health care, and innovation challenges.

In addition, the EU, through the Horizon Europe Programme, aims to promote STI collaboration for researchers and innovators from around the world by providing funding opportunities for international collaborative research projects and scholarships. Furthermore, the EU also participates in bilateral science and technology agreements with many countries around the world, developing science diplomacy to enhance international cooperation and address global challenges. These efforts have produced significant positive changes, including increased participation of researchers from non-EU countries in developing the STI field.

4. Some implications for Vietnam

4.1. Overview of some existing problems in STI development in Vietnam

- Although Vietnam has made some progress in STI development, the level of investment in research and development (R&D) is still low compared to developed countries. Vietnam's R&D spending accounts for only about 0.3-0.4% of GDP, much lower than advanced countries (currently the EU accounts for about 2% of GDP). The lack of investment in R&D leads to a lack of highly applicable research, a few domestically originated innovative products, and a dependence on imported technologies.
- Although scientific research facilities in Vietnam have developed, the innovation ecosystem still lacks close connections between researchers, businesses, and financial institutions. Technology transfer from research institutes and universities to businesses has not been effectively promoted. Research results are rarely applied to production and business, leading to "waste" of research resources, slowing down the process of innovation and productivity improvement in the economy.
- The startup environment in Vietnam has developed strongly in recent years but still lacks synchronous support policies and a strong international connection network. Startups do not have enough opportunities to access capital, research resources, and advanced training programs.
- SMEs account for a large proportion of the Vietnamese economy, but most of these enterprises are financially weak, lacking the ability to apply new technology and digital transformation. Although there are several support programs, the policy system for SMEs in the STI field is limited and not strong enough. SMEs have difficulty in innovating and applying new technology, leading to a lack of competitiveness and difficulties in increasing product-added value.
- Intellectual property protection in Vietnam still faces many difficulties. Although Vietnam has made progress in improving its legal framework on intellectual property, the enforcement of intellectual property rights and anti-piracy remain major problems. The lack of a strong IP protection

system reduces the motivation to innovate and develop domestic technology products while making it difficult to attract investment from international businesses and organizations.

- Although Vietnam has an abundant labor force and low labor costs, the quality of human resources has not yet met the requirements of the creative economy and Industry 4.0. The lack of specialized skills in areas such as artificial intelligence (AI), big data, blockchain, and automation is a major weakness. Human resources are not fully trained and there are not enough experts to promote innovation, to apply new technologies, and to develop advanced industries.

4.2. Some implications for Vietnam from EU practice

Based on the implementation of the EU's STI development and its relevance to the requirements of the new context, as well as from Vietnam's current STI development problems, the author proposes some implications for Vietnam in implementing the STI development policy as follows:

Firstly, the EU's experience is to always focus on increasing investment in research and development (R&D) as a key factor in promoting the knowledge economy. While the EU has achieved an R&D spending ratio of about 2% of GDP, Vietnam needs to aim to increase investment in R&D, especially in advanced science and technology fields such as artificial intelligence, blockchain, biotechnology, and renewable energy technology. To do so, Vietnam needs to create mechanisms to encourage investment from both the public and private sectors in R&D, while prioritizing investment in breakthrough technologies and industries with high growth potential, thereby promoting innovation in all areas.

Secondly, the EU has been successful in building a comprehensive innovation ecosystem, including research institutes, universities, businesses, and the government. One of the important factors in this ecosystem is the connection and cooperation between stakeholders, creating a favorable environment for innovation and the application of research results into practice. Vietnam needs to develop a strong and synchronous innovation ecosystem, with close connections between research institutions, businesses, and the government. Policies to support and promote public-private partnerships, encourage technology transfer, and increase access to finance for startups are essential to creating a sustainable innovation environment.

Thirdly, the EU experience shows that the potential impact of any such effort depends on the authority and mandate given to it by political actors. It is essential to strike a balance that considers all key stakeholders from the perspective of research, development, and innovation, while also ensuring that policies remain balanced and predictable over time. Creating public-private partnership (PPP) efforts does not require new institutions. Instead, it

calls for innovative policy approaches, initiatives, and governance models that transcends cross-sectoral, administrative, and institutional boundaries to make this PPP a priority.

Fourthly, the EU has invested heavily in the digital transformation and application of Industry 4.0 technologies in key industries, such as smart manufacturing, agriculture 4.0, and smart transport. The integration of digital technologies into all areas of production and services increases productivity and improves product quality. The implication for Vietnam is to accelerate the digital transformation program, focusing on applying advanced technologies such as AI, Big Data, Internet of Things (IoT) in key industries such as manufacturing, agriculture, logistics, and public services. At the same time, it is necessary to create policies to support SMEs in accessing new technologies and transforming business models.

Fifthly, the EU has a very well-developed public finance system for innovation, including programs such as Horizon Europe to fund high-impact research and innovation projects. The implication for Vietnam is that it is necessary to create financial mechanisms to support research, innovation, and creativity, especially in strategic areas such as digital technology, renewable energy, and smart manufacturing. Funding programs, venture capital funds, and tax incentives for R&D projects need to be improved and expanded.

Finally, Vietnam, as an active member of the ASEAN region, can propose policy initiatives on STI development for the entire ASEAN region based on the EU's experience. For instance, Vietnam should propose multilateral cooperation programs among ASEAN countries within the framework of ASEAN summits to create cross-border STI projects, similar to the EU's Horizon Europe programs. In addition, Vietnam should propose to ASEAN to establish a common STI funding entity for ASEAN to help member countries share resources and expertise in scientific research and technological innovation as well as create common research networks among research institutes and universities in the region to promote knowledge exchange and technological development. The EU has developed a common set of criteria for assessing the innovation of member countries, which is the European Innovation Scoreboard - EIS. This tool has helped the EU assess and compare the level of innovation of each member country to build and implement STI development policies. Vietnam should propose to ASEAN to build innovation rankings in ASEAN to measure and promote the spirit of innovative competition among member countries in the region.

5. Conclusion

In the current context, the European Union (EU) is facing many factors that strongly impact the development of STI, including rapid technological change, the transformation of the economy to more sustainable models, climate change challenges, and increasing global competition. To meet the

challenges and requirements in this context, the EU has implemented many STI development policies to create a solid foundation for innovation and maintain a globally competitive position. These policies, as well as lessons learned from the implementation process, can bring valuable implications for Vietnam in developing its STI./.

REFERENCES

1. Europarl (2023). “The EU's global approach to research and innovation”. <https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2022)733550>
2. European Parliamentary (2022). “The EU's global approach to research and innovation”. <https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/733550/EPRS_BRI(2022)733550_EN.pdf>
3. European Parliament (2016). “Official Journal of the European Union: GDPR”. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679>
4. EC (2022). The Innovation Principle. <https://research-and-innovation.ec.europa.eu/system/files/2022-07/ec_rtd_factsheet-innovation-principle.pdf>
5. European Parliament (2024). “Artificial intelligence act”. <https://www.europarl.europa.eu/RegData/etudes/BRIE/2021/698792/EPRS_BRI(2021)698792_EN.pdf#:~:text=URL%3A%20https%3A%2F%2Fwww.europarl.europa.eu%2FRegData%2Fetudes%2FBRIE%2F2021%2F698792%2FEPRS_BRI%282021%29698792_EN.pdf%0AVisible%3A%200%25%20>
6. Europarl (2023). “The EU's global approach to research and innovation” <https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2022)733550>
7. European Parliamentary (2022). “The EU's global approach to research and innovation” <https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/733550/EPRS_BRI(2022)733550_EN.pdf>
8. EC (2024). “European Research Infrastructure Consortium - ERIC”. <https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/european-research-infrastructures/eric_en>
9. Federico Casolari et al. (2023). “The EU Data Act in Context: A Legal Assessment” <https://www.researchgate.net/publication/374985181_The_EU_Data_Act_in_Context_A_Legal_Assessment>
10. González, S.; Kubus, R.; Mascareñas, J (2018). “Innovation Ecosystems in the European Union-Toward a theoretical framework for their structural advancement assessment”. CYELP-Croat. Yearb. Eur. *Law Policy* 2018, 14, p.182-217.
11. Jennie Clarke (2024). “The Complete Guide to the EU Cyber Resilience Act” <https://www.globalrelay.com/resources/the-compliance-hub/rules-and-regulations/european-cyber-resilience-act-explained/>.