



HAL
open science

Coordinated input to the next Research & Innovation Framework Programme (FP10) for the systematic integration of standardisation

Paul Killeen, Andreas Jenet, Gergely Tardos, Carlos Lopez Rodriguez, Reka
Hosszu, Fabio Taucer

► To cite this version:

Paul Killeen, Andreas Jenet, Gergely Tardos, Carlos Lopez Rodriguez, Reka Hosszu, et al.. Coordinated input to the next Research & Innovation Framework Programme (FP10) for the systematic integration of standardisation: A non-paper. 2024. hal-04591427

HAL Id: hal-04591427

<https://hal.science/hal-04591427>

Preprint submitted on 28 May 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - NonCommercial 4.0 International License



Coordinated input to the next R&I Framework Programme (FP10) for the systematic integration of standardisation

A non-paper

Killeen, P., Jenet, A., Tardos, G., Lopez Rodriguez, C.,
Hosszu, R., Taucer, F., Haavisto, K.

2024

This document is a publication by the Joint Research Centre (JRC), the European Commission's science and knowledge service. It aims to provide evidence-based scientific support to the European policymaking process. The contents of this publication do not necessarily reflect the position or opinion of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of this publication. For information on the methodology and quality underlying the data used in this publication for which the source is neither Eurostat nor other Commission services, users should contact the referenced source. The designations employed and the presentation of material on the maps do not imply the expression of any opinion whatsoever on the part of the European Union concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Contact information

Name: Dr Andreas Jenet
Address: Rue du Champ de Mars 21, 1050 Brussels
Email: andreas.jenet (at) ec.europa.eu
Tel.: +32 2 299 11 11

EU Science Hub

<https://joint-research-centre.ec.europa.eu>
JRC135511

Brussels: European Commission, 2024

© European Union, 2024



The reuse policy of the European Commission documents is implemented by the Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Unless otherwise noted, the reuse of this document is authorised under the Creative Commons Attribution 4.0 International (CC BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

For any use or reproduction of photos or other material that is not owned by the European Union permission must be sought directly from the copyright holders.

Cover page illustration, © Adobe stock #219800810 / stock.adobe.com

How to cite this report: European Commission, Joint Research Centre, Killeen, P., Jenet, A., Tardos, G., Lopez Rodriguez, C., Hosszu, R. and Taucer, F., *Coordinated input to the next Randle Framework Programme (FP10) for the systematic Integration of Standardisation*, Haavisto, K. editor(s), European Commission, Brussels, 2024, JRC135511.

Contents

Abstract 2

1 Policy context 3

2 The role of standardisation in R&I valorisation 4

 2.1 What has happened so far 4

 2.2 Missing elements from Horizon Europe 5

3 Proposed Actions 6

4 Conclusions 8

Annexes 9

 Annex 1. Benefits of integrating R&I and Standards for Impact at Scale 9

Abstract

The non-paper underscores the necessity of developing new standards and increasing EU participation in international standardisation to boost industry competitiveness and align with the European Green Deal and the New Industrial Strategy. Recognizing geopolitical shifts, particularly China's influence, adaptation is crucial. The role of standardisation in Research and Innovation is pivotal, serving as a policy instrument to bring research results to a global market. The European Standardisation Strategy advocates stronger integration of R&I and standardisation for societal, economic, and environmental impact. Gaps in Horizon Europe are identified, urging the extensive use of the R&I base and greater emphasis on standards development. Proposed actions for FP10 involve addressing key challenges, supporting common European positions on international standards, and integrating R&I testbeds for ongoing feedback. Governance includes leveraging the EC Excellence Hub to connect research policy and building a network for designing FP10. The emphasis on adapting to geopolitical realities, integrating R&I and standardisation, and addressing Horizon Europe gaps reflects a comprehensive approach toward enhancing industry competitiveness and sustainability.

1 Policy context

As emphasised in the European Green Deal¹ and in the New Industrial Strategy for Europe², developing new standards, coupled with increased EU participation in international standardisation bodies, will be essential to boost industry's competitiveness and build a sustainable future. As set out in the Communication European Economic Security Strategy³, the EU needs to be able to shape international standards in line with its values and interests – and with its legal acquis. With respect to the future artificial intelligence, data or cyber resilience acts, the EU will work on European standards and towards congruent international standards together with partners. Standardisation plays a critical role in the roll-out of the Commission Recommendation on critical technology areas for the EU's economic security⁴.

Based on the underlying strong evidence for the capacity of standardisation in R&I result valorisation, the USA plans to explicitly recognize and support participation in standardisation activities by Federal R&D grantees and funding recipients – via its new 'National Standards Strategy for Critical & Emerging Technology'⁵. For example, the National Science Foundation is updating its proposal and award policies and procedures to explicitly include participation in standards development activities. The growing footprint of China in international standardisation – as highlighted in its 2021 'Standardization Outline' – has contributed to the politicisation of standard-setting in the context of growing geopolitical rivalry. The impact of standardisation ranges from economic competitiveness to legislation, national security and the discreet transformation of values enshrined in technologies. The EU needs to adapt to the new geopolitical realities.⁶

¹ COM(2019) 640 final

² COM(2020) 102 final

³ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52023JC0020&qid=1687525961309>

⁴ C(2023) 6689 final

⁵ [US-Gov-National-Standards-Strategy-2023.pdf \(whitehouse.gov\)](https://www.whitehouse.gov/wp-content/uploads/2023/01/US-Gov-National-Standards-Strategy-2023.pdf)

⁶ <https://dx.doi.org/10.53121/ELFFEJ3>

2 The role of standardisation in R&I valorisation

Standardisation is a key policy instrument to help valorise research results and bring them to market at scale across the European Single Market and internationally. Standards help implement legislation by providing consensus-based expert opinion across a broad range of external stakeholders and are used extensively in specifying innovation procurement requirements. As illustrated in the diagram below, standards help bridge the innovation gap between research and global markets by building customer trust and confidence in new technologies, thus enabling the accelerated mass-market diffusion and adoption of related products and services across all sectors. Technology readiness levels describe the development of a technology along the innovation lifecycle. Lower readiness levels are typically associated with standards related to terminologies and concepts, metrology and testing, use cases and reference architectures; while later-stage readiness levels involve standards related to interoperability, system integration and performance. Hence, standardisation activities are important for researchers and innovators across all readiness levels, technologies, and application domains. Understanding the existing standards landscape also ensures that researchers build on top of state-of-the-art standards, thereby avoiding ‘reinventing the wheel’ and ensuring their research results are market-ready and scalable across global markets.

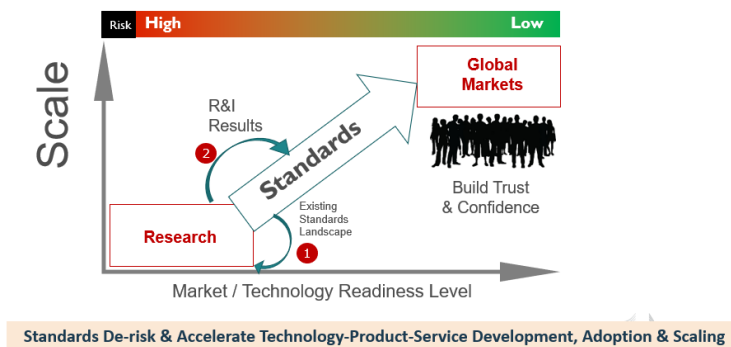


Figure 1 Why integrate standards, research, and innovation? Bridge the innovation gap for impact at global scale. Standards de-risk and accelerate technology–product–service development, adoption, and scaling.

2.1 What has happened so far

The European Standardisation Strategy⁷ has among its pillars the topic of driving stronger and more systematic integration of Research, Innovation (R&I) and Standardisation to deliver greater social, economic, and environmental impact from R&I activities. The key strategic role of standards is underlined by the Council Recommendation on the Guiding principles for knowledge valorisation⁸ where measures and policy initiatives were adopted for improving knowledge valorisation in the Union, by broadening the scope of actors and focusing on the entire R&I ecosystem. In this context, further actions are needed to raise strategic awareness among researchers and innovators of the very substantial benefits of integrating R&I and

⁷ COM(2022) 31

⁸ Council Recommendation (EU) 2022/2415 of 2 December 2022 on the guiding principles for knowledge valorisation <http://data.europa.eu/eli/reco/2022/2415/oj>

standardisation, and to provide support on how to do this integration successfully for maximum value creation and impact – including beyond the life of individual projects. The Code of Practice on Standardisation⁹ is a key policy document in the context of the European Research Area (ERA) strategy that promotes standardisation as a powerful and currently under-utilized knowledge valorisation tool.

2.2 Missing elements from Horizon Europe

Europe's R&I base needs to be exploited more extensively and systematically in identifying and transferring relevant research results into new and existing European and international standards, as well as incentivising and supporting more EU R&I experts to engage in European and International standards development. Refer to Annex 1 for a more comprehensive overview of the benefits to Europe and to European R&I stakeholders of engaging in standards development activities, including supporting the scaling of European Start-ups & SMEs.

The next R&I framework programme should significantly increase the number of project calls that explicitly require consideration of standardisation as an expected. A more intensive mobilisation of European R&I experts and networks, Public Private Partnerships (including Joint Undertakings) and policy-driven stakeholder dialogues (e.g. High Level Forum; TTCs and Digital Partnerships; Multi-Stakeholder Platform on ICT Standardisation) is necessary to actively promote and participate in strategic international standards development in areas of high policy priority for the EU.

Mechanisms that enable the ongoing integration of research results into standards beyond the life of individual projects are sporadic. Longer lasting R&I projects, initiatives or entities with the capacity and incentives to engage in standardisation over extended periods of time could support the valorisation of R&I results by standardisation.

⁹ Commission Recommendation (EU) 2023/498 of 1 March 2023 on a Code of Practice on standardisation in the European Research Area. <http://data.europa.eu/eli/reco/2023/498/oj>

3 Proposed Actions

In order to achieve the above objective, FP10 should:

- Address key challenges faced by the R&I community in engaging in standardisation by implementing the policy recommendations in the Code of Practice on Standardisation¹⁰ - working in coordination with key support partners across the European R&I community including RTOs, Universities and TTOs. This should be translated as specific requirement for FP10 by embedding it in the guidance for Work Programme development and in the Model Grant Agreement.
- Support beneficiaries in developing common European positions and contributions on key international standards for critical new and emerging technologies - aligned with EU policy objectives, embedding European values and working in collaboration with like-minded international partners.
- Require applicants to consider cooperation with other projects in the topic area to provide common contributions to standardisation e.g. via Coordination & Support Actions.
- Integrate R&I testbeds and standardisation activities to establish ongoing feedback loops to enable the validation of new standards - thereby achieving high quality and timely standards setting.
- Provide standardisation supports for projects as a comprehensive one-stop-shop and mentoring for researchers and innovators on how to get their project results reviewed and accepted by relevant standards bodies e.g. expanded Horizon Standardisation Booster.
- Support innovative European startups and SMEs to successfully scale their business internationally via early and strategic engagement in standards development – building their innovations on top of the foundational standards they help create.
- Define and incorporate standardisation criteria for initial project evaluation, funding and reporting.
- Ensure that participation in standardisation activities is explicitly recognised as eligible costs.
- Include standardisation activities in project evaluation reviews. Link with the innovation radar¹¹.
- Require researchers to consider the existing standards landscape as a key state-of-the-art input when planning their projects to ensure the market relevance and scalability of their results from the outset.

¹⁰ Commission Recommendation (EU) 2023/498 of 1 March 2023 on a Code of Practice on standardisation in the European Research Area. <http://data.europa.eu/eli/reco/2023/498/oj>

¹¹ Innovation Radar: <https://innovation-radar.ec.europa.eu>

- Encourage inclusion of standardisation partner(s) with experience of participation in relevant standards committees at National, European or International level(s) in project consortia.

Governance:

Leverage the **EC Excellence Hub**¹² to connect research policy with legislative and market requirements. Build a network of policy officers and managers from across all services active in standardisation in designing FP10.

¹² Communication from the Commission to the European parliament, the Council, the European economic and social committee and the Committee of the regions. An EU Strategy on Standardisation Setting global standards in support of a resilient, green and digital EU single market (COM/2022/31) <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0031>

4 Conclusions

The coordinated input from the non-paper emphasises the strategic importance of developing new standards and increasing EU participation in international standardisation bodies to enhance industry competitiveness and promote sustainability, aligning with the European Green Deal and the New Industrial Strategy for Europe. Acknowledging the geopolitical landscape, particularly China's growing influence in standard-setting, the text underscores the need for the EU to adapt to new realities. The non-paper highlights the pivotal role of standardisation in research and innovation (R&I) valorisation, stressing its significance in bridging the innovation gap and ensuring market-ready and scalable results. The European Standardisation Strategy aims for a more systematic integration of R&I and standardisation, point out the substantial benefits of this integration for social, economic, and environmental impact. However, non-paper identifies also missing elements in Horizon Europe, calling for extensive exploitation of the R&I base and increased focus on standards development. Proposed actions for FP10 include addressing key challenges, supporting common European positions on international standards, and integrating R&I testbeds for ongoing feedback. The proposed governance structure involves leveraging the EC Excellence Hub to connect research policy with legislative and market requirements and building a network of policy officers and managers across services actively involved in standardisation in the design of FP10.

Annexes

Annex 1. Benefits of integrating R&I and Standards for Impact at Scale

There are many benefits of engaging in standards development for current and new emerging technology areas. The following is a summary of benefits for individual researchers and innovators, and for R&I organisations and projects, in engaging in standardisation.

Impact from R&I Activities: Standards help deliver real impact from R&I projects by helping to bridge the gap between R&I and global mass-market adoption of innovative new technologies, products and services – by building customer trust and confidence in standards-based solutions, as well as enabling scale-up effects.

Competitive Advantage – Get Ahead of the Curve: By engaging in standards development activities with leading international experts and knowledge-networks, researchers and innovators stay ahead of the curve in their technical area and help set-the-standards for new and emerging technologies, and related products and services.

Better understanding of the State of the Art (SoA) landscape: Standards provide a good overview of the SoA landscape. Piggybacking on existing or under-developed standards can help R&I projects to maximise their resources i.e. by investing in add-on innovations and avoiding “reinventing the wheel”.

Global Knowledge Transfer, Dissemination & Networks: Standards are very widely distributed and used internationally across all industries and sectors, thereby providing a strong, sustainable and very impactful knowledge transfer and dissemination channel for R&I results, as well as a powerful networking and information sharing platform.

International Market Access & Scaling: European and international standards provide access to large regional and global markets for innovative new products and services. Standards also enable the free movement of goods, services and data by removing technical barriers to trade. Taking existing standards into account at the beginning of R&I activities guarantees that subsequent innovative results, data, products and services will respect existing standards (and any new or modified standards developed within the project) and will therefore have faster and broader international market uptake by customers and end users.

Platform for Research, Innovation, Sustainability & Resilience: Standards represent the state-of-the-art for a given technology or product area and hence provide a platform on which to build successful research and innovation projects, products and services. Standards in areas including digital technologies, energy, environment and resource efficiency & recycling also help ensure a sustainable and low-carbon future for all. Standards directly address the United Nations Sustainable Development Goals and can help build resilience against external shocks e.g. value chain disruptions, pandemics etc.

Interoperability & Digital Transformation: Standards provide a basis for the integration of diverse technologies into complex, innovative systems and solutions, and enable interoperability between components, products and services thereby avoiding vendor lock-in and providing more choice for customers globally – a critical role in a world undergoing digital transformation across all industry sectors.

Authority, Reputation & Credibility: As active members of the standards development community, the reputation and credibility of experts increase with industry partners, customers, investors, policy makers and public funders.

Research Integrity & Data Quality: Ensuring that R&I results are based on recognised test and measurement standards assures the quality and validity of research data and associated

research publications, products and services – thereby protecting the reputation of the European R&I system.

Compliance with Regulations: Standards support organizations, including SMEs, to comply with European regulations across many industry sectors and product-services categories, in the context of the EU Single Market in a global world. Compliance with harmonized standards provides a presumption of conformity with the corresponding requirements of harmonization legislation. Companies, particularly SMEs, can use harmonized standards to cost-effectively and efficiently demonstrate that their products, services or processes comply with relevant EU legislation.

Innovation Procurement: Standards represent state of the art in terms of innovative technologies, products and services, and hence are often used as references in National and International public procurement schemes by government departments and agencies. Private businesses and corporations also refer to standards in their procurement processes, in order to help ensure the quality, performance and interoperability of any products and services that they purchase or subscribe to via the extensive and growing range of cloud services.

Scaling Startups & SMEs: The earlier an R&I expert, project or organisation engages in the standards development process - integrated within their overall research & innovation process and strategy as illustrated in *Figure 1*- the sooner they can bring their standards-informed innovations to competitive global markets, resulting in greater value and rewards.

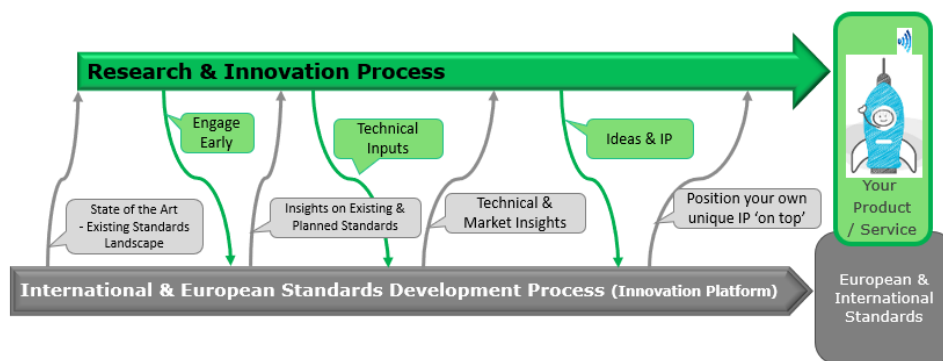


Figure 2 Scale European SMEs and Start-ups globally through strategic engagement in standards development

Hence, innovation & standards development leaders get ahead of the curve by leveraging their early and active involvement in setting new standards. During the standards development process, they also obtain valuable technical and market insights to inform their R&I strategy and evolving technology and product roadmaps and gain a time-to-market advantage over their competitors, due to their early and active engagement in developing the new standards. These leaders (including SMEs and start-ups) also gain the opportunity to position and add their own unique product or service innovations on top of the foundational standard they helped create. Examples of European Startups and SMES that have successfully scaled their business internationally based on early and strategic engagement in standards development as outlined above include the following:

- Bitmovin: Successful spin-out company from European university that engaged strategically in ETSI/3GPP standards development.
- Hear the lead academic Researcher, VC funder & CEO in brief video clip below <https://www.standardsplusinnovation.eu/bitmovin>
- Openet: Successful European start-up and global scale-up that engaged strategically in ETSI/3GPP standards development. <https://www.standardsplusinnovation.eu/openet>
- Iona: Past spin-out and successful global scale-up from European University

- Founder is now a VC with Atlantic Bridge (and their 'University Bridge' fund) <https://christhorne.wordpress.com/2009/03/25/using-standards-as-business-development-strategy/>

Patent Licensing Income: In some cases, 'R&I + Standardisation' leaders introduce their patents directly into new standards - once they commit to openly license their so called 'standard essential patents' (SEPs)¹³ on Fair Reasonable & Non-Discriminatory (FRAND)¹⁴ terms to future implementers of the standards/technologies in question. SEP licensing can provide significant revenues and profits to innovators who successfully integrate standardisation within their R&I processes and acts an important incentive for such innovators to engage in standards development. Traditionally such SEP licensing was focused in the telecoms sector, but as connectivity and the Internet of Things (IoT) expands across all sectors, so too will SEP licensing opportunities.

Testbeds & Standards – Towards Agile Standards Development & Deployment: The digital and green transformation of industry across all sectors poses challenges to traditional standardisation due to the complexity, dynamics, and accelerating speed of technological progress. The need for a timely availability of standards calls for new approaches and tools to enhance standardisation processes. Industry and standards development organizations worldwide are seeking new solutions. Testbeds have been acknowledged in innovation policy as a powerful tool for knowledge transfer and the further development of emerging technologies. Lately, they have also attracted increasing attention from the standardization perspective as a promising tool for a more agile standards development process. Proponents of such testbeds expect them to support standardization by providing validated solutions and accelerating processes to meet the growing demands for faster standardisation without any detriment to quality.¹⁵

Such integrated 'testbeds & standardisation' processes establish ongoing feedback loops between R&I testbeds and the standards development process via the relevant standard's technical committee(s). This in turn enables the ongoing validation and editing of the draft standards as they progress through the various drafting stages to final publication - thereby achieving better standards faster.

Anticipation of Policy Needs: The fast pace of technology development creates an important space for foresight and anticipation for areas where standards can be beneficial to support innovation. As an example, over the last years significant public resources have been invested in research for Quantum technologies. In order to valorise the research efforts, a timely response from European standardisation organisations to set up pre-standardisation platforms has been very helpful. The science community have used these platforms to agree on common definitions and metrology aspects for their laboratory work in order to make their results comparable. Also, the European Commission has used these specifications to undertake its procurement of quantum infrastructures of the High-Performance Computing Joint Undertaking (EuroHPC JU) and Quantum Communication Infrastructure (EuroQCI). Hence innovators and industries can integrate the technologies in real-world applications from early on.

Similarly, the ERA (European Research Area) industrial technology roadmaps are reviewing novel technologies critical for policy development and implementation e.g. green deal and

¹³ Bekkers, R., Henkel, J., Mas Tur, E., Van Der Vorst, T., Driesse, M., Kang, B., Martinelli, A., Maas, W., Nijhof, B., Raiteri, E. and Teubner, L., Pilot study for essentiality assessment of Standard Essential Patents, Thumm, N. editor, EU Publications Office, 2020, <https://dx.doi.org/10.2760/325320>.

¹⁴ Thumm, N., Ménière, Y., Fair, Reasonable and Non-Discriminatory (FRAND) licensing terms – Research analysis of a controversial concept. EU Publications Office, 2015. <https://dx.doi.org/10.2791/348818>

¹⁵ Towards Agile Standardization: Testbeds in Support of Standardization for the IIoT. Claudia Koch and Knut Blind, IEEE Transactions on Engineering Management. July 2020

digital transition. Several of these technologies are still low in their technology readiness level and standards are currently lacking to lift these technologies and enable them to access international markets.

Standards are also critical for policy making as they help to implement legislation by adding a consent opinion on measurements, definitions, benchmarks and procedures. In the current progress of the artificial intelligence act, the importance of standards has been highlighted in interpreting and defining the requirement of inclusive, non-biased and trustworthy artificial intelligence as the factual translation of the legislation that provided the ethical baseline.

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online (european-union.europa.eu/contact-eu/meet-us_en).

On the phone or in writing

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696,
- via the following form: european-union.europa.eu/contact-eu/write-us_en.

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website (european-union.europa.eu).

EU publications

You can view or order EU publications at op.europa.eu/en/publications. Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre (european-union.europa.eu/contact-eu/meet-us_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex (eur-lex.europa.eu).

Open data from the EU

The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

Science for policy

The Joint Research Centre (JRC) provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society



EU Science Hub

joint-research-centre.ec.europa.eu