European Innovation Act

European Commission | Call for Evidence

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About EIROforum

The European Intergovernmental Research Organisation forum brings together eight of Europe's largest research organisations:

CERN, EMBL, ESA, ESO, ESRF, EUROfusion, European XFEL, ILL

The mission of EIROforum is to combine the resources, facilities and expertise of its member organisations to support European science in reaching its full potential. www.eiroforum.org

Contact persons
Innovation Management and Knowledge/Technology Transfer Working Group

- Aude de Clercq, ESDI Strategy and Policy Lead, ESA | Aude.de.Clercq@esa.int
- Enrico Chesta, Knowledge Transfer Group, CERN | Enrico.Chesta@cern.ch

International Affairs Working Group

- Anne-Charlotte Fauvel, EU Relations Lead, EMBL | anne-charlotte.fauvel@embl.org

As Europe seeks to reinforce its competitiveness and technological sovereignty, the European Innovation Act represents a strategic step forward. The **European Intergovernmental Research Organisation forum** (EIROforum) welcomes this initiative and strongly supports its aim to improve access to infrastructures and intellectual assets for innovative companies.

EIROforum[1] brings together eight of Europe's largest intergovernmental research organisations (CERN, EMBL, ESA, ESO, ESRF, EUROfusion, European XFEL and ILL). These organisations drive frontier basic research, operate world-class infrastructures, and act as innovation accelerators through their collaborations with industry[2]. The scientific excellence of EIROforum members requires constant innovation and new technologies that are developed with industry partners through co-creation and high-tech procurement. EIROforum facilities also underpin Europe's innovation capacity by advancing fundamental knowledge and providing user services for product development, technology validation and training.

The European Innovation Act offers a timely opportunity to capitalise on the role that large research-performing organisations and world-class infrastructures already play in Europe's innovation ecosystem. EIROforum proposes the following key priorities, with supporting examples provided as Annex (page 5).

1. Reinforce the Role of Research Infrastructures as Engines of Scientific and Technological Innovation

Research infrastructures are centres of scientific excellence as well as catalysts of innovation. They provide specialised laboratories, advanced testing facilities, unique experimental environments, and scientific and technical expertise that directly support industrial innovation. **Embedding this dual research and technology contribution in legislation and funding frameworks** would provide a clearer mandate and enable infrastructures to expand their innovation services while safeguarding their scientific missions. For example, ILL[3] and ESRF[4] industrial access services already show how infrastructures can accelerate the translation of research into market-ready applications.

This can be further supported and enhanced through specialised structures dedicated to innovation partnerships such as ESA's Phi-Lab[5] and Business Incubation Centres[6], CERN Venture Connect[7], and EMBL Ventures[8], which show commitment and drive in supporting spin-off generation and scaling start-up business. They are often coupled with programmes

[1] https://www.eiroforum.org/
[2] Examples of success-cases of EIROforum members' support to European enterprises can be found in the following brochure: https://www.eiroforum.org/wp-content/uploads/brochure-eiroforum-imktt.pdf
[3] https://www.ill.eu/industry/ill-services-for-industry
[4] https://www.esrf.fr/Industry
[5] https://philab.esa.int/
[6] https://commercialisation.esa.int/esa-business-incubation-centres/
[7] https://ventureconnect.cern/
[8] https://www.embl-ventures.com/

dedicated to applications in specific areas with high societal impact, such as the CIPEA (CERN Innovation Programme on Environmental Applications)[9]. **Specific measures facilitating the creation within infrastructures of spin-off companies and supporting their development in critical technology areas would be particularly welcome.**

These activities also play a crucial role in Europe's human capital development: thousands of highly trained researchers move from EIROforum facilities into industrial R&D roles each year. **The European Innovation Act should support this mobility**, including through improved career pathways for non-EU talent trained by European infrastructures to join European companies.

A further opportunity lies in **incentivising the industrial uptake of open-source technologies generated within international research organisations**. EIROforum members are natural hubs for collaborative innovation and generate significant advances in both software and hardware. Start-ups, in particular, can play a decisive role in adapting and customising these open solutions for wider market adoption. Appropriate incentives would **ensure that the benefits of open science are more effectively translated into industrial competitiveness.**

2. Enhance Development of and Access to Research-Driven Technology Infrastructures (RTIs)

EIROforum members, CERN, EMBL, ESRF, ILL and European XFEL, host specialised laboratories such as irradiation facilities and beamline experiment set-ups that rely on advanced research infrastructures to deliver unique testing conditions to their wide-ranging user communities. **Directly supporting the development of new RTIs or the upgrading of existing ones, including new tailored innovation-driven services, would strongly benefit business-critical research activities** (where enabling frameworks exist).

Several EIROforum members have already piloted SME access support programmes using EC funding – for example, enabling almost 100 SMEs to have access to analytical RIs across Europe[10]. Yet access remains difficult for many smaller companies due to risk, cost, lack of in-house expertise and administrative barriers. Sustainable solutions are needed to lower these hurdles. **Dedicated funding schemes, vouchers, and simplified procedures would ensure that SMEs and start-ups can benefit more widely from such resources.**

Fast-tracked and flexible access mechanisms, would also help shorten innovation cycles. Finally, academic access programmes that integrate industrial users have proven highly effective in generating knowledge spill overs, and should be further encouraged.

[9] https://kt.cern/environment
[10] See for reference: Supporting European SMEs with smarter access to research infrastructures: Experience from three European projects

3. Strengthen Co-Development Models and Public–Private Partnerships

Joint ownership and co-development between infrastructures and industry have consistently demonstrated their value in aligning research infrastructure technology needs and capabilities with those of industry. The development of advanced detectors at European XFEL, or the computing partnerships within CERN openlab[11], illustrate how long-term public-private collaboration generates technologies with applications far beyond research. A step towards co-development involves transfer of facility technology as supported by, for example, EMBL's Technology Transfer Office (EMBLEM[12]) and the CERN Knowledge Transfer unit[13].

To maximise this potential, the European Innovation Act should **provide frameworks for flexible intellectual property arrangements, shared funding models, virtual shareholding schemes and innovative governance mechanisms**, that empower both public research organisations and private partners. By building on flagship initiatives such as **ATTRACT[14]**, Europe can foster dynamic ecosystems that integrate frontier research with entrepreneurship and industrial innovation.

In addition, specific support is needed to **fill the gap between fundamental R&D and industrial production**. European instruments for prototype development and reaching intermediate technology readiness levels are currently too limited and often restricted to Pre-Commercial Procurement schemes, which are not always adequate for this stage of development. **More flexible instruments are required to enable infrastructures and their industrial partners to advance promising technologies beyond proof-of-concept and closer to market application.**

4. Leverage Procurement as a Driver of Innovation

Procurement by research infrastructures often stimulates suppliers to develop world-class technologies that subsequently find applications in wider markets. Examples include cryogenic systems, high-precision optics, and advanced detector technologies, where European suppliers have become global leaders thanks to demanding tenders from EIROforum members.

The European Innovation Act should support mechanisms that allow innovations developed through research infrastructure procurement to be scaled into broader industrial markets, thereby strengthening Europe's industrial competitiveness.

[11] https://openlab.cern/
[12] https://embl-em.de/
[13] https://kt.cern/
[14] ATTRACT is an EU-funded initiative gathering six of Europe's leading scientific laboratories and EIROforum members together with industry and experts in business and entrepreneurship to develop next-generation scientific tools and co-create new products, companies and jobs. https://attract-eu.com/

Annex – Supporting Examples from EIROforum members

1. Reinforce the Role of Research Infrastructures as Engines of Scientific and Technological Innovation

- **ESA**'s Business Incubation Centres/Phi-Lab and Tech transfer programme have successfully spun off start-ups and innovative companies that leverage space technologies for terrestrial markets.
- **CERN** Venture Connect (CVC) provides a structured platform to assist start-ups in leveraging CERN technologies and expertise. Its tailored technical support, along with access to partner investors, innovation hubs and talents, have supported deep tech start-ups in various domains such as manufacturing, agritech, AI, and advanced computing. To date, the programme supports 13 companies, combining ventures founded by CERN alumni with startups from the broader global innovation ecosystem, located across 10 different countries. A strong example is the company InPhocal, which has adapted CERN's structured laser beam technology to develop a new generation of high-precision laser systems.
- **European XFEL** has integrated into its innovation strategy the co-creation of dedicated experiments for applied science, as well as co-innovation through mechanisms of knowledge and technology transfer, followed by co-development. For example, during the construction phase, two in-kind contributors to European XFEL (DESY and INFN) enabled, through knowledge transfer, two companies, RI Research Instruments GmbH and ZANON Research & Innovation S.r.l., to produce a large series of superconducting cavities. The infusion of knowledge and technology into the companies' expertise in economies of scale led to highly successful results, and companies gained recognized authority in the global big-science market.
- Innovation and Translation is one of the essential missions of **EMBL.** 25 years ago, EMBL established its own tech transfer arm, EMBLEM, which supports the creation of spin-off companies and works closely with industrial partners to accelerate the transfer of innovative technology, from the lab to the market. Today EMBL has 30 start-ups and spin-offs, 1,000 inventions in its portfolio and more than 400 active license agreements with industry.
- **ESO**'s programmes developing world's largest and most advanced Telescopes and Instruments enables multiple industries to develop world class technologies (cryogenics, high precision optics, detectors, etc.), which led to many patents being granted to Industry, thus enabling technology licencing and further transfer of these technologies to other application domains.

2. Enhance Development of and Access to Research-Driven Technology Infrastructures

- **CERN** and GSI are developing facilities enabling high energy heavy ion testing of space electronics devices and systems and advances in shielding and radiobiology in the frame of HEARTS EU project; these facilities provides testing conditions very useful to new-space companies to develop innovative satellite solutions; transnational

access is granted in the frame of RADNEXT (2021-2026) to academic and industry users publishing results.

- **ILL** and **ESRF** offer industrial users access coupled with expertise - often from its wide network of knowledge providers - to translate neutron and synchrotron data into product improvements.
  ILL has been engaged in the production of radioisotopes for medical applications for more than 15 years. ILL's High-Flux Reactor, its neutron irradiation facility, is used for the production of critical medical radioisotopes used for radiopharmaceutical therapies for cancer treatment and diagnosis, in collaboration with companies such as ITM. This activity did not happen in a vacuum, and emerged from the ILL's programme on nuclear physics which has been running for many decades. This constitutes a clear example of how RIs and TIs can exist on a continuum - with RIs establishing the technology that underpins TIs.

3. Strengthen Co-Development Models and Public–Private Partnerships

- **EMBL** has a long successful history in technology development in collaboration with industrial partners. Technology development in context of the EMBL Imaging Centre aims to drive industrial early-stage next generation technologies in an "open innovation" environment. Technology development is done side by side with users testing new technologies for applicability in their research. Partner companies can thus feed these experiences directly back into their R&D, to make sure new products deliver what users need to accomplish their research goals.
- In the frame of the **European XFEL** construction, a German–Italian collaboration involving PN Sensor and partner co-developed the DSSC megapixel detector to meet demanding soft X-ray requirements such as 4.5 MHz readout, large dynamic range, and operation in vacuum and cryogenic environments. Since then, DSSC has spurred advances in DEPFET-based detectors and inspired adaptations for other photon-science and imaging systems, including the EDET detector for fast electron microscopy. (see for reference: Novel sensor developments for photon science at the MPG semiconductor laboratory). European XFEL and partners co-developed the MTCA.4 crate standard with nVent SCHROFF, producing about 250 enclosures for XFEL. Offering improved timing, synchronization, and remote management, MTCA.4 has since been widely adopted by other accelerator and research facilities as a standard for high-performance modular electronics. (reference paper: The case of MTCA.4).
- Supported by EC funding, **ESRF** created a tailored service driven by urgent needs at BASF for data to drive materials discovery, which has led to the creation of a start-up company Momentum Transfer.
- **CERN** openlab is a unique public-private partnership, through which CERN collaborates with leading technology companies and other research organisations to accelerate the development of cutting-edge computing technologies for the research community. Its framework not only fosters collaboration but also facilitates industry participation and investment.
- **ATTRACT** is a pioneering initiative creating a co-innovation ecosystem and bringing together Europe's fundamental research and industrial communities to lead the next generation of detection and imaging technologies.

4. Leverage Procurement as a Driver of Innovation

- Some examples of procurement driven innovation at the **European XFEL**:
  - Beckhoff adapted its PC-based control systems to meet the sub-micrometer precision and synchronization requirements of European XFEL's undulators, and the resulting solutions strengthened its broader industrial automation portfolio across sectors such as manufacturing and robotics.
  - X-Spectrum, a spin-off company that commercialized advanced detector technology originally designed for FEL experiments, now offers products such as the Lambda and Sparta detector line to life-science and materials research laboratories worldwide.
  - JJ X-Ray, after winning the major tender to deliver instrumentation for the FXE beamline, leveraged this experience to expand its portfolio and today provides advanced optics and precision instrumentation not only for synchrotron and FEL facilities, but also for neutron beamlines and applied science projects such as space instrumentation.
  - Similarly, Linde's helium cryogenic plant built for European XFEL not only met the demanding needs of the accelerator but also reinforced the company's position as a leading supplier of cryogenic systems for both scientific infrastructures and industrial applications worldwide.
- **CERN** has published a dedicated study describing 28 success stories illustrating the impact of CERN procurement actions on industry, and the results of CERN's supplier impact survey report showing for instance that 52% of the respondents found or opened new markets while working with CERN.