

PROJECT: 101058398 — RICH EUROPE



Research Infrastructures NCPs Network Consortium for Horizon Europe

BEST PRACTICES BOOKLET

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1. EXECUTIVE SUMMARY



Research Infrastructures (RIs) have significant potential to drive regional and local socio-economic development by aligning with Smart Specialization Strategies (S3), as highlighted in the ESFRI White Paper (2020). Under the RICH Europe project, a 2024 survey across EU member states examined practices and policies fostering synergies between RIs, S3 goals, and regional research priorities. The findings underscore the critical role of partnerships between industry, RIs, and scientific research in achieving regional development objectives.

This booklet presents case studies and strategies showcasing the alignment of RIs with S3 frameworks across various countries. It highlights the capacity of RIs to contribute to regional innovation ecosystems and national development agendas.

Additionally, it raises awareness of the need for RIs to enhance their outreach, demonstrating their tools and services to small and medium enterprises (SMEs) and other regional stakeholders.



2. INTRODUCTION

In the [Europe 2020 Strategy](#), the European Commission emphasized the role of research and innovation (R&I) as key drivers of social and economic prosperity and environmental sustainability within the EU. This focus is reflected in the [Commission's priorities for 2019–2024](#), which highlight R&I's critical contributions to four of its six strategic goals: the European Green Deal, fostering an inclusive economy, creating a Europe fit for the digital age, and strengthening Europe's position in the world.

The importance of Research Infrastructures (RIs) is further emphasized in the reflection paper "Towards the Sustainable Europe by 2030", which outlines the EU's ambition to achieve a resource-efficient and climate-neutral economy. It highlights that a green transition can coexist with increased prosperity, provided that the EU and its Member States lead the way in science, technology, and modern infrastructure development.

During the 2014–2020 period, the EU invested heavily in R&I through two main funding sources: Horizon 2020 (H2020) with a total budget of €76.4 billion, and the European Structural and Investment Funds (ESIFs), which allocated close to €41 billion to R&I, 95% of which came from the European Regional Development Fund (ERDF). Together, these funds represented 12% of the EU's budget during this period.

For the 2021–2027 period, R&I funding has increased further, with €95.5 billion allocated under Horizon Europe, €56 billion estimated from the ERDF, and €44.4 billion earmarked for R&I in recovery and resilience plans as of March 2022.

A notable initiative to foster synergies between EU funding mechanisms is the Horizon Europe Coordination and Support Action [HORIZON-WIDERA-2023-ACCESS-04-01 Pathways to Synergies](#). This program aims to strengthen links between Horizon Europe and cohesion policy programs, particularly the ERDF, INTERREG, and the Resilience and Recovery Fund (RRF). These synergies are vital for helping widening countries improve their R&I performance and reducing the innovation divide across Europe. While complementary to existing initiatives like Teaming and Excellence Hubs, this action addresses gaps in capturing the full range of potential synergies.

The 2030 regional policies also call for Thematic Smart Specialisation Platforms to promote collaboration among regional managing authorities with shared priorities. These platforms encourage the exchange of competencies, shared use of infrastructure, scaling up regional efforts, and the development of joint investment projects.

3. CONTENT SECTION

This case study examines the strategic frameworks for developing research and innovation infrastructures in Bulgaria, Spain, the Czech Republic, Latvia, and Italy.

Each country employs distinct approaches, highlighting the critical role of research infrastructures (RIs) in driving innovation, fostering regional development, and enhancing international collaboration. Across these examples, Smart Specialisation Strategies (S3) emerge as powerful tools to align diverse funding instruments and policy goals.

IN BULGARIA,

the **National Strategy for the Development of Scientific Research (2017–2030)** prioritizes the creation of Centers of Excellence (CoE) and Centers of Competence (CoC) to achieve regional scientific leadership by 2030. Notable initiatives such as **PlantaSYST** and **GATE** underscore Bulgaria's efforts to strengthen its research ecosystem. These projects leverage regional specialization while aligning with key European instruments like Horizon Europe, reflecting commitment to integrating RIs into broader innovation frameworks.

SPAIN

embeds its RI development within the **Spanish Strategy for Science, Technology and Innovation (2021–2027)**, complemented by the **ICTS Map**—a national roadmap for Singular Scientific and Technical Infrastructures. This strategic approach prioritizes excellence in research and development (R&D), fosters inter-regional partnerships, and supports international participation. Flagship initiatives such as the **Plataforma Solar de Almería** and **PLOCAN** illustrate Spain's success in connecting national and regional infrastructures to global research networks.

IN THE CZECH REPUBLIC,

the focus lies on national coordination and international cooperation, guided by the **Roadmap of Large Research Infrastructures** and the **Johannes Amos Comenius Operational Program**. Czech RIs, including the **ELI ERIC**, play a pivotal role in facilitating regional economic transformation while advancing global scientific competitiveness. These efforts underscore the Czech Republic's ability to align national strategies with European and international priorities.

LATVIA,

despite lacking a dedicated research infrastructure strategy, integrates its RI initiatives into the **National Development Plan** and **Smart Specialisation Strategy**. Supported largely by the **European Regional Development Fund (ERDF)**, Latvia concentrates on fostering regional innovation, particularly in key areas such as agriculture and forestry research. This pragmatic approach enables Latvia to address national priorities while leveraging European funding.

IN ITALY,

national and regional strategies converge under the umbrella of the **Smart Specialisation Strategy (S3)**, bolstered by the **National Recovery and Resilience Plan (PNRR)**. Italian RIs contribute significantly to economic modernization and digital transformation, encouraging international partnerships and maximizing the use of EU funding opportunities. This dual focus on local and global collaboration positions Italy as a key player in advancing innovation-driven growth. Collectively, these strategies reflect diverse but complementary approaches, each contributing to the broader European vision for research excellence and innovation-led development. By aligning national objectives with regional and European priorities, Bulgaria, Spain, the Czech Republic, Latvia, and Italy exemplify how RIs can drive sustainable development, scientific progress, and technological innovation.

**Policy mix
implemented
facilitating the
development of
the National
Roadmap for
Research
Infrastructures by
financing RIs via
state budget
ERDF
national programs
and
international
programs**



THE CASE OF BULGARIA

The **National Strategy for the Development of Scientific Research in the Republic of Bulgaria (2017–2030)** outlines a comprehensive plan to strengthen Bulgaria's research ecosystem through the establishment of **Centers of Excellence (CoE)** and **Centers of Competence (CoC)**. These initiatives are integral to achieving regional scientific leadership and fostering international collaborations by 2030. The strategy is implemented in three distinct phases:

1. Stage of Recovery (2017–2022): This phase focused on revitalizing scientific research by establishing attractive conditions for researchers, particularly young scientists, and creating the infrastructure needed for high-impact scientific activity. Proper evaluation mechanisms were also emphasized to ensure the effectiveness of research initiatives.

2. Stage of Accelerated Development (2023–2025): During this phase, newly established CoEs and CoCs are expected to operate at full capacity, aligning their research outputs with the average European level. Key objectives include increasing the quality and volume of R&D activities, fostering regional innovation, and solidifying Bulgaria's role within European research networks.

3. Stage of Scientific Research at the Global Level (2026–2030): The final stage aims to elevate Bulgaria's research to globally competitive standards. Efforts will focus on producing internationally recognized scientific outputs, enhancing technology transfer, and expanding partnerships with foreign institutions.

The **National Road Map for Scientific Infrastructure (NRRI)** operationalizes the strategic goals outlined in the National Strategy and aligns with Bulgaria's **Innovation Strategy for Smart Specialization (IS3)**. It emphasizes the modernization of research infrastructure to:

- Retain highly qualified researchers within the country.
- Attract young scientific talent.
- Strengthen international scientific cooperation.

Since its adoption, the NRRI has been implemented in the following stages:

- **Stage 1: Increased Participation in Horizon Europe and Capacity Building (2020–2023):** This phase focused on constructing and maintaining existing facilities while preparing new sites for competitive funding opportunities under programs like the **European Regional Development Fund (ERDF)**.
- **Stage 2: Building Links to Innovation (2024–2025):** Efforts in this phase will prioritize enhancing the effectiveness of existing infrastructures, ensuring sustainability, and achieving self-sufficiency.
- **Stage 3: Advancing Technology Transfer and Clustering (2026–2027):** Activities will focus on technology transfer, clustering, and transforming infrastructures into technological hubs. Initiatives will also aim to attract foreign scientists and companies while creating a supportive environment for user engagement and researcher career development.



The **PlantaSYST** project aims to establish the **Center of Plant Systems Biology and Biotechnology (CPSBB)** in Plovdiv, Bulgaria, as a collaborative effort between four Bulgarian research institutes and two leading institutions in Germany: Potsdam University and the Max Planck Institute of Molecular Plant Physiology.

Key objectives of PlantaSYST include:

- Strengthening Bulgaria's position as a leader in plant sciences in Eastern Europe.
- Bridging gaps identified in the national Smart Specialization Strategy (S3) by integrating expertise in molecular biology, genomics, metabolomics, bioinformatics, and biotechnology.
- Educating the next generation of early-stage researchers in cutting-edge scientific fields such as molecular breeding and plant systems biology.

The **GATE (Center of Excellence)** project focuses on advancing Bulgaria's capacity in big data research and innovation. It is a joint initiative between Sofia University, Chalmers University of Technology (Sweden), and Chalmers Industrial Technology.

Key highlights of GATE:

- **Strategic Goals:** To create an autonomous institute dedicated to big data research, fostering an ecosystem for innovation, modern infrastructure, and open collaboration.
- **Economic and Social Impact:** GATE trains data specialists and strengthens partnerships between academia, industry, and government to improve competitiveness in sectors such as smart cities and ICT.
- **Regional Role:** As the only big data-focused Center of Excellence in Eastern Europe, GATE disseminates best practices and innovative models across EU widening countries, contributing to the Bulgarian Innovation Strategy for Intelligent Specialization (ISIS).

GATE also addresses the ISIS priority on data-driven services, particularly in areas such as artificial intelligence, digital transformation, and smart city development, positioning Bulgaria as a leader in big data innovation.

By aligning national goals with European funding opportunities such as Horizon Europe and ERDF, Bulgaria continues to enhance its capacity for impactful research, foster innovation, and strengthen its position within the European research landscape.

Bulgaria's strategic approach to research infrastructure development, supported by initiatives like PlantaSYST and GATE, demonstrates a clear commitment to advancing regional and global scientific leadership.

THE CASE OF SPAIN

In Spain there is a policy mix implemented as the RI National Roadmap (**ICTS Map**) is funded by national funds (through the Spanish Strategy for Science, Technology and Innovation 2021-2027 and the State Plan for Scientific and Technical Research and Innovation), regional funds (linked to the S3) and European Funds (mostly ERDF and Recovery, Transformation and Resilience Plan).

The strengthening of the ICTS is one of the fundamental elements of the **"Spanish Strategy for Science, Technology and Innovation 2021-2027" (EECTI)**, which considers the updating and implementation of the ICTS as a driving force for the promotion of excellence. The EECTI 2021-2027 frames the actions related to ICTS mainly within the objective 4 of the general objective "Promote R&D&I and its Transfer", called "Generate knowledge and scientific leadership", which seeks to promote the quality of scientific excellence and, in particular, the quality of the ICTS.



The State Plan for Scientific and Technical Research and Innovation (PEICTI) has as main priority the development of an R&D&I system, and as specific objective to develop, maintain and invest in the equipment and infrastructures necessary for leading scientific and technological advances, with actions aimed at improving scientific-technical facilities, particularly the Singular Scientific- Technical Infrastructures (STI).

The EECTI 2021-2027 is configured as one of the frameworks that provide coverage for the Smart Specialization Strategies (S3) developed by the Autonomous Regions and the State Plan for Research, Development and Innovation. This structure allows greater administrative coordination between the regional and national levels.

The update of the ICTS Map, and the revision of the Spanish Strategy for the participation in scientific infrastructures and international organizations, support the EECTI 2021-2027 to prioritize investments in national and international infrastructures. Therefore, the process of updating the ICTS Map serves as the basis for establishing the multi-year plan for budgeting and prioritizing ICTS-related investments. Coordination with the S3s, at the level of the different Autonomous Regions, is an essential axis in the process of updating the ICTS Map.

The ICTS will be also eligible for co-financing under the **multi-regional ERDF Operational Program and the regional ERDF operational programs** that may be established by the Autonomous Communities.

It is worth mentioning the **Recovery, Transformation and Resilience Plan**. It includes a package of measures for institutional reforms and strengthening of the capacities of the National Science, Technology and Innovation System, through the strengthening of calls for: R&D&I projects; human resources and scientific-technical equipment; renovation of major national infrastructures; allowing the funding from the European Recovery Fund called Next Generation EU.

The Plataforma Solar de Almería (PSA), a dependency of the Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), is the largest concentrating solar technology research, development and testing center in Europe. PSA activities are integrated in the CIEMAT organization as an R&D division of the Department of Energy. More details about PSA can be found here: <https://www.psa.es/en/index.php>

They are involved in several projects at a regional, national and international level. Some examples of projects are as follows:

- SOLAR TREATMENT OF WATER UNIT: SolarChem 5.0- Research project corresponding to the 2021 call, reference: TED2021- 130173B-C43.

Projects aimed at the ecological transition and the digital transition, within the framework of the Spain Plan for scientific, technical and innovation research 2021-2023. Funding Institution/Program: Ministry of Science, Innovation and Universities (MCIU), AEI/European Union NextGenerationEU /PRTR).

- SOLAR THERMAL APPLICATIONS UNIT: HORIZON-CL4-2022-RESILIENCE-01-14: [SUSTAINABLE MEMBRANE DISTILLATION FOR INDUSTRIAL WATER REUSE AND DECENTRALISED DESALINATION APPROACHING ZERO WASTE](#). Project Acronym: MEloDIZER
- [CE-SC5-04-2019 - Building a water-smart economy and society: WATER-MINING](#): The project is called WATER-MINING because as well as identifying sustainable methods for treating wastewater and obtaining alternatives sources of usable water, the project does so while recovering (or mining) valuable products from the residues generated during the process.

The Oceanic Platform of the Canary Islands (PLOCAN) is a public Consortium created in 2007 between the Ministry of Education and Science and the Government of the Autonomous Community of the Canary Island, with the aim of building, equipping and operating a set of marine infrastructures for research in the field of marine sciences and technologies.

It complements funds through international competitive calls – mainly from the EC (Horizon 2020, Horizon Europe), and national and regional calls –mainly from the Canarian region. All the details can be found [here](#).

Some projects as example:

- Direct grant from the Canarian region: [H2 GREEN:Renewable Energy and Hydrogen](#)
- H2020-BG-2020: The Future of Seas and Oceans Flagship Initiative: [Technologies for Ocean Sensing](#)
- H2020-INFRAIA-2020-1: [Metrology for Integrated Marine Management and Knowledge- Transfer Network](#)



More information: <https://www.vyzkumne-infrastruktury.cz/en/strategy/>

The case of the Czech Republic

In 2009, a brand-new legislative instrument to support top-class RIs from the public funds of the Czech Republic was integrated into Act No 130/2002 Coll., on the Support of Research, Experimental Development and Innovation from Public Funds and on the Amendments to Some Related Acts that stipulates conditions for the provision of aid for research and innovation.

- The [updated Roadmap of Large Research Infrastructures](#) of the Czech Republic was published in 2023. The roadmap contains a total of 43 LRI projects implemented across all scientific areas.
- LRI proposals are submitted to the Czech Government for approval of their public funding - MEYS uses the Czech state budgetary resources on research and innovation to finance LRI's operation costs, while their investment costs are covered in a synergic and complementary way by the EU Cohesion Policy Funds.
- The Johannes Amos Comenius Operational Programme (OP JAK), which also falls under the responsibility of MEYS, constitutes the toll through which the LRIs' investment costs are financed in the current EU programming period.
- A third of the budgetary resources mobilised by MEYS for RI funding are specific research and innovation funds dedicated to financing the participation of the Czechia in international research and innovation organisations and ERIC consortia.
- The [ELI ERIC](#) is a very good example of an effective combination of funding from the Framework Programmes, the national budget and the EU Structural Funds. This large-scale RI on high power and fast pulse lasers and their applications unites two pillars, one in CZ, one in HUN, both financed, with structural funds, under the legal structure of an ERIC. A third pillar in RO, also funds with structural funds, is founding observer and plans to fully join the ERIC.

The Case of Latvia

Latvia does not have a separate strategy for research infrastructure; it is included in the National Development Plan (NDP) and the Smart Specialization Strategy (S3). Research infrastructure investments are primarily supported through European Regional Development Fund (ERDF) funding, such as in previous periods and current. ERIC coordination is supported through a different mechanism. There are no targeted support mechanisms specifically for physical scientific infrastructure development beyond these.

The Case of Italy

In Italy S3 is shaped both by the Central Government and the Regions (Regioni). Specifically, guidelines and national strategic priorities are indicated by the Government; on the other hand, Regions use their legislative power to better indicate S3 actions that contribute to the achievement of the objectives at local level, taking into consideration the regional socio and economic environment. To guarantee coordination and fruitful support to regions and local administrations, ad hoc platform was established in 2018, Laboratorio Nazionale sulle Politiche di Ricerca e Innovazione (National Lab for R&I Policies), in the framework of the European Structural and Investment Funds 2014-2020. This platform is still available for the 2021-2027 funds.

S3 acts in synergy with the Next Generation EU plan. The recovery plan in Italy (PNRR, Piano Nazionale di Ripresa e Resilienza) highlights the importance of strengthening the digitalization, competitiveness and innovation capacities and the educational and research systems (respectively, mission 1 and mission 4). Therefore, PNRR actions and efforts can also benefit the overall system of S3. In addition, both the national and regional strategies encourage international cooperation at European and International level, specifically promoting interregional collaborations and exchanges.

Lastly, due to their impact and multisector availability, Research Infrastructures (RIs) play a central role for the full implementation of the Smart Specialization Strategies: RIs can be used for the integration of data, for synergies with entrepreneurial field, for the support to academic investigations and for the promotion of international cooperation in the Research and Innovation fields.



The share of the infrastructures (or Centers operating as RIs) that have regional dimension (outside the Capital city/region) funded in the previous Programming period (2014 – 2020) out of the total number of newly established infrastructures

The Bulgarian Operational Programme "Science and Education for Smart Growth" (SESG) is the only Operational Programme in Bulgaria co-funded by both the ESF and the ERDF for the period 2014-2020. Over €673 million (of which €596 million from the EU budget) were invested to help strengthen research and innovation, general and higher education, and vocational training in Bulgaria. Under this OP, 140 out of 286 infrastructures (48.95%) in Bulgaria have regional dimension (outside the capital city region). The territorial balance and share of funds regarding CoE and CC – 92% of the Bulgarian CoE are in the capital city region, while for the CC the percentage is 71%.

The Spanish Scientific and Technical Singular Infrastructures (ICTS) are distributed through the national territory and are collected in the [ICTS Map](#). The map includes 29 ICTS that bring together 64 infrastructures. 50 out of these 64 infrastructures are sited outside the capital region (78%)

Most research infrastructures in the Czech Republic connect research facilities located in several regions, i.e. they have a regional dimension. Additionally, most of the Czech research infrastructures have been built during the previous programming period (2007-2013). The list of those 48 infrastructures is available here: <https://www.opvavpi.cz/cs/siroka-verejnost/projekty.html>.

Given the specificity of the Call, those infrastructures are all outside of the capital city (i.e., Prague). So you can clearly see the regional dimension as well as the different sectors supported.

In Latvia, according to the National Research Infrastructure Analysis (2023), a significant portion of research infrastructures is located outside Riga. Specifically, 29% of the reported research infrastructure units are based in regions, predominantly related to agricultural and forestry research. This distribution ensures a balanced regional development of research capacities across Latvia.



EXAMPLES OF INSTRUMENTS AND APPROACHES IMPLEMENTED IN YOUR COUNTRY FOR THE PURPOSE OF STRENGTHENING PARTNERSHIP BETWEEN INDUSTRY, RESEARCH INFRASTRUCTURES AND SCIENTIFIC RESEARCH ON NATIONAL AND IS3 REGIONAL LEVEL

BULGARIA

Priority direction 1: Sustainable development of the national capacity for scientific research and innovation

The implementation of the second and third stages of the **National Strategy for the Development of Scientific Research (2017–2030)** will focus on financing Centers of Excellence (CoE) and Centers of Competence (CoC). At least **75% of funding** will be allocated to scientific research activities, including the development of scientific and innovation capacity. The remaining 25% will be dedicated to complementary activities, such as the modernization and renovation of research infrastructure and equipment necessary for achieving core objectives.

Key action groups include:

- **Development of CoE and CoC under OP SESG (2014–2020):** Funding will support the implementation of Development and Sustainability Programs based on business plans and the progress made in OP SESG projects. These programs will incorporate recommendations from the Joint Research Center report, "Strategic Assessment of Bulgarian Centers of Competence and Centers of Excellence and Recommendations for Their Future Development."
- **Enhancing Regional Innovation Capacity:** To address regional imbalances, reduce centralization, and stimulate socio-economic development, CoE and CoC will be tasked with regional research functions. These tasks will be specified within their respective budgets to ensure tailored contributions to regional needs.

- **Support for Strategic Infrastructures:** Funding will be directed toward a limited number (up to three) infrastructures from the **National Road Map for Scientific Infrastructure (NRRI)** or their associations. These infrastructures will play a pivotal role in Bulgaria's commitments to the **Green Deal**, the **blue economy**, and the **low-carbon and circular economy**, with applications in marine research, agriculture, and food systems.
- **Support for IS3-Aligned and SDG-Focused Projects:** Competitive funding will be allocated to research projects addressing Bulgaria's **Innovation Strategy for Smart Specialisation (IS3)** thematic areas and the **United Nations Sustainable Development Goals (SDGs)**. The focus will be on projects with regional relevance in less developed areas, particularly those contributing to the economic and digital advancement of the country and its regions.

Priority direction 2: Stimulation of international scientific cooperation and participation in the framework programs of the EU

This priority aims to increase Bulgaria's participation in EU framework programs and strengthen international collaboration. Key measures include:

- **Additional Funding for Teaming-Type Projects:** Funding will target Bulgarian organizations participating in Horizon Europe's horizontal priority, "Expanding Participation and Strengthening the European Research Area (ERA)." Specific support will also be provided for projects under **Twinning** and **ERA Chairs** that have passed evaluation thresholds but lacked sufficient funding in earlier rounds.

- **Complementing Investments through the NRRP:** These interventions will build on investments made under Pillar 1, Operation 1 of the **National Recovery and Resilience Plan (NRRP)**, specifically the **Program for Accelerating the Recovery and Transformation of the Economy through Science and Innovation**. The NRRP actions cover projects up to 2023, while additional funding under this plan will support initiatives from 2024 onwards, extending through the **Horizon Europe** program or until the available resources under the **Program for Research, Innovation and Digitalization for Economic Transformation (2021–2027)** are fully utilized.

SPAIN¹²

The **Spanish Strategy for Science, Technology, and Innovation (EECTI 2021–2027)**, together with the **State Plans for Scientific, Technical, and Innovation Research (PEICTI)**, forms the national framework for integrating regional Smart Specialisation Strategies (S3). This alignment ensures that regional priorities are consistent with national objectives, creating a cohesive approach to research and innovation policy. PEICTI emphasizes the critical role of R&D&I infrastructures in driving scientific and technological development, with contributions from public administrations, companies, and technology centers. It highlights the importance of equipping institutions with the resources necessary to achieve excellence in knowledge generation and experimental development.

Key Highlights of PEICTI and EECTI Frameworks:

- PEICTI is organized into **five horizontal programs** and **three transversal programs**, with the **R&D&I Infrastructures Program** being pivotal in strengthening scientific and technical capacities.

- Related activities are supported through the **Institutional Strengthening Subprogram**, which focuses on optimizing the operations of research institutions across public and private sectors.

Core Objectives for Research Infrastructures:

- Supporting institutions through grants to enhance **access to and interoperability of scientific information** across digital infrastructures.
- Financing the **acquisition and modernization** of research equipment to enable cutting-edge research.
- Improving institutional efficiency to **maximize research outputs and innovation potential**.

Specific Funding Actions for 2024–2027:

- **€244 million:** Acquisition of scientific-technical equipment (AEI).
- **€20 million:** Equipment for biomedicine and health sciences (ISCIII).
- **€758 million:** Grants for Singular Scientific and Technical Infrastructures (ICTS).
- **€1.017 billion:** Participation in international organizations.
- **€23 million:** Contributions to CERN, ESO, DUNE, and HKK for experiments and upgrades.
- **€4 million:** Data federation aligned with the **European Open Science Cloud (EOSC)**.
- **€30 million:** Platforms supporting biomedicine R&D&I (ISCIII).
- **€1.2 billion:** Spain's contribution to ESA's internationalization initiatives.

The **ICTS Map**, updated in 2021, serves as a critical tool for long-term planning and investment in national infrastructures. It ensures alignment between the **National Government** and **Autonomous Communities**, enabling strategic funding to support infrastructures that address both national and regional priorities.

¹ <https://www.ciencia.gob.es/InfoGeneralPortal/documento/6e566243-bcb5-45d8-ab77-5cfe533060f2>

² https://www.fondoseuropeos.hacienda.gob.es/sitios/dgfc/es-ES/ipr/fcp2020/P2127/PF/Documents/Programa_POPE.pdf

Spain's participation in international initiatives, such as those under the **ESFRI Roadmap** and **Very Large Research Infrastructures (VLRIs)**, strengthens resource sharing and global collaboration. ICTS actions focus on:

- Creating and maintaining ICTS, including **cataloging R&D&I capacities**.
- Promoting **interoperability of national digital infrastructures** with the EOSC.
- Supporting infrastructures that maximize **scientific, technological, and societal impact**.

PEICTI's **Complementary R&D&I Plans** further promote collaboration between the **National Government** and **Autonomous Communities**, enhancing territorial cohesion. These plans identify shared interests and leverage regional S3 strategies as the foundation for joint programs, aligning with Spain's **ERDF Pluri-regional Operational Program**. The plans ensure the effective use of resources to build a more integrated and efficient research and innovation ecosystem.

Aligned with the **Association Agreement for Spain (2021–2027)**, investments in research infrastructures prioritize:

- **Applied Research:** Supporting universities, research centers, and companies to strengthen technological capacities through **modernized infrastructure and high-tech equipment**.
- **Knowledge Transfer:** Encouraging collaboration between research institutions and the private sector to bring innovations to market.
- **Strategic Focus:** Prioritizing infrastructures with significant business or societal relevance to ensure maximum return on investment.

By combining strategic planning, robust funding mechanisms, and coordinated efforts, Spain's approach under the EECTI and PEICTI frameworks strengthens its position as a leader in scientific excellence and technological innovation within the European research landscape.

CZECH REPUBLIC

In the Czech Republic, research infrastructures are integral to establishing domains of specialization under the **Research and Innovation Strategy for Smart Specialization (RIS3)**. These infrastructures actively engage in the entrepreneurial discovery process, participating in discussions and negotiations as key stakeholders to align research priorities with regional development needs.

A primary focus of the national Smart Specialisation Strategy (S3) is leveraging high-quality and well-equipped research infrastructures to facilitate economic transformation. This includes fostering international cooperation, enhancing the quality and efficiency of public research, and ensuring a strong connection between research activities and the demands of businesses and society. By aligning these elements, the Czech Republic aims to create a dynamic innovation ecosystem where research drives industrial modernization and addresses societal challenges.

Research infrastructures also serve as critical tools for increasing scientific competitiveness and improving the capacity of public research institutions. By linking research outputs to business innovation and societal needs, they contribute to both national and regional development goals. For further details, visit the official RIS3 website: <https://www.ris3.cz/en>.





Latvia

In Latvia, funding for Practical Research Projects is directed toward applied research initiatives that promote collaboration between industry and research infrastructures. These projects aim to bridge the gap between academic research and industrial application, fostering innovation and addressing industry-specific challenges. Additionally, **Postdoctoral Research Support** programs provide opportunities for postdoctoral researchers to work in partnership with industrial collaborators, strengthening ties between academia and the private sector while enhancing the research capabilities of both.

To further bolster regional innovation, **Targeted Regional Innovation Programs** are implemented to enhance local research and development capacity. These programs actively encourage the participation of local businesses in research activities, driving economic growth and enabling innovation at the regional level.



DESIGNED INTERVENTIONS IN YOUR COUNTRY WITH REGARDS TO SECURE THE SUSTAINABILITY OF EXISTING RIS AND SUPPORT THE SETUP OF NEW RIS (TO ADDRESS NEW IS3-DEFINED CHALLENGES)

BULGARIA

In Bulgaria, the proposed interventions are designed to address targeted actions necessary for strengthening the **science, technology, and innovation (STI) ecosystem**.

The first set of interventions focuses on achieving **policy coherence in STI** by:

- Improving interaction and coordination across the fields of scientific research, innovation, and technology to address existing gaps and maximize impact.
- Increasing funding for the STI ecosystem, ensuring that allocations are tied to clearly defined objectives.
- Expanding support for research and development activities, particularly in **ICT** and scientific infrastructures.
- Enhancing the legal framework for scientific research and innovation, including provisions for public-private partnerships and intellectual property management, through the development of a **new Law for the Promotion of Scientific Research and Innovation**.
- Establishing and fostering sustainable partnerships between universities, research institutions, and businesses to facilitate the transfer of knowledge, technologies, and innovations to strategic sectors of the economy, as well as addressing emerging challenges and crises.
- Strengthening international cooperation at the governmental level (bilateral and multilateral) and promoting the internationalization of higher education institutions and universities.
- Building and developing a national ecosystem for scientific research and innovation, fostering connectivity and productive interaction among all participants.
- Refining criteria for the professional development of researchers, including better reward systems to attract and retain young talent.
- Enhancing the framework of incentives and resources for knowledge and technology transfer, as well as the commercialization of public research.
- Promoting effective communication strategies among higher education institutions, research organizations, and entities under the National Research and Development Institute.
- Supporting applied scientific research to transform findings into innovative products, services, or processes that can be introduced to the market.
- Expanding capacity and expertise in scientific research, innovation, and technological transformation, while ensuring better alignment with programs like **Horizon Europe**.
- Increasing the appeal of scientific professions through national programs for reintegrating Bulgarian scientists and introducing differentiated, performance-related pay systems.
- Ensuring the sustainability of a critical mass of researchers and implementing clear measures to foster the growth of national human capital in scientific research.
- Promoting the internationalization of scientific results to increase global visibility and impact.

The second set of interventions is aimed at **improving the management and performance of the research system** by:

SPAIN

In Spain, interventions to ensure the sustainability of existing Research Infrastructures (RIs) and support the establishment of new ones are closely tied to the periodic update of the **ICTS Map**. This strategic tool serves as the framework for planning and prioritizing Singular Scientific and Technical Infrastructures (ICTS) at the national and regional levels.

The **Council for Scientific, Technological, and Innovation Policy (CPCTI)** is responsible for approving the configuration and composition of the ICTS Map, based on recommendations from the **Advisory Committee for Singular Infrastructures (CAIS)**. For an infrastructure to be included in the ICTS Map, two conditions must be met:

1. The infrastructure must undergo a **scientific-technological evaluation**.

- This evaluation is carried out by the CAIS, supported by the **Coordination and Evaluation Department of the State Research Agency (AEI)** and the **Ministry of Science, Innovation and Universities (MICU)**.
- The infrastructure must submit a report detailing its strategic goals, a set of results and performance indicators from the preceding four years, and a comprehensive Strategic Plan.

2. The inclusion must be recognized as a **priority** by both the National Government and the Autonomous Regions.

- This support must be demonstrated by the Administrations and entities that own the infrastructure, guaranteeing its operational capacity, competitive open access, and financial sustainability.
- Financial sustainability is typically achieved through access to national, regional, or European funds, such as the **European Regional Development Fund (ERDF)**, to support the infrastructure's Strategic Plan during the Map's validity period.

All ICTS included in the Map are required to provide forecasts of the investments needed to maintain their scientific and technological competitiveness. The technical and economic data submitted by these infrastructures will form the basis for a multi-annual reference plan, guiding budget allocations and investment priorities. This planning aligns with the objectives of the **2021-2027 ERDF programming period**, supporting the development of capacities that bolster smart specialization strategies and enhance national and regional competitiveness in research and innovation.

The ICTS Map undergoes a comprehensive revision every four years to ensure it reflects the evolving needs and priorities of the research ecosystem. Periodic monitoring of the results and performance indicators of ICTS is integral to this process. **The Ministry of Science, Innovation and Universities (MICU)** oversees this evaluation and reports to the Sectorial Commission of the CPCTI and the CAIS to ensure transparency and accountability.

CZECH REPUBLIC

The Czech Republic has fully committed to implementing all **European Research Area (ERA) Actions**, actively contributing to the advancement of the European research infrastructure (RI) and research and innovation (R&I) ecosystem. The country aligns its national RI strategy with the **European Strategy Forum on Research Infrastructures (ESFRI)**, adhering to its guidance on the monitoring and development of research infrastructures.

Since 2014, **Czech Large Research Infrastructure (LRI)** projects have undergone regular assessments conducted through an international peer-review process. The outcomes of these evaluations serve as an independent expert foundation for evidence-based policymaking. This approach enables the Czech government to make informed decisions regarding the allocation of public funding to LRIs for upcoming multiannual periods.

As part of its **RIS3 strategy**, the Czech Republic has introduced the **mission-oriented approach** to research and innovation policy. This new instrument focuses on addressing societal challenges, ensuring that research and innovation activities are strategically aligned with national and European priorities for societal impact and sustainable development.

LATVIA

Latvia has implemented targeted interventions to ensure the sustainability and continued development of its research infrastructures (RIs). These interventions focus on enhancing financial stability, promoting strategic planning, and addressing regional innovation priorities.

1. Science Base Funding Model

Introduced in 2022, this funding model allocates **5% of base funding** specifically for the maintenance of research infrastructure. While the model establishes a foundation for sustainable infrastructure support, the detailed mechanism for fund allocation is currently under development.

2. Strategic Development Programs

New research infrastructures are encouraged to design and implement comprehensive **business plans** that promote long-term sustainability and self-sufficiency. These plans aim to reduce reliance on external funding while ensuring alignment with national and regional research goals.

3. Regional Development Support

Dedicated support measures target research infrastructures that contribute to **regional development** and address challenges identified in Latvia's **Smart Specialisation Strategy (IS3)**. These measures prioritize infrastructures that enhance regional innovation capacity and foster collaboration between research institutions and local businesses.





USEFUL LINKS AND REFERENCES

- [EC on Smart Specialisation Strategies](#)
- [EC on fostering regional competitiveness and resilience to face global challenges](#)
- [ESFRI on Research Infrastructures as strategic investments](#)