



MINISTRY OF RESEARCH,
INNOVATION AND
DIGITALIZATION

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Executive agency for higher
Education, Research, Development
and Innovation Funding



UNIONE EUROPEA



National Strategy for Research, Innovation and Smart Specialization

The National Plan for Research, Development and Innovation

2022-2027

Glossary

NS	National Strategy
NP	National Plan
RDI	Research, Development and innovation
R&D	Research and development

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ABOUT THE STRATEGY, THE PLAN AND THE PROCESS BEHIND

Research, Development and Innovation (RDI) is the backbone on which the future rests. By investing in RDI, we invest in competitiveness, well-being and solving major societal challenges. In addition to the direct benefits to companies and users, RDI plays an essential role in promoting sustainable development in all its components - economic, social and ecological - and in increasing the quality of life for all.

In this context, the National Research, Innovation and Smart Specialization Strategy 2022-2027 (NS) sets Romania's vision for the national RDI system at the 2030 horizon and establishes the strategic objectives for strengthening our scientific and technological base. Approved by Government Decision no. 933/2022, the NS reflects ambition and determination, being the result of a co-creation process, capitalizing on the close partnership between the Ministry of Research, Innovation and Digitalization (MCID), the Executive Unit for the Financing of Higher Education, Research, Development and Innovation (UEFISCDI), research organizations, academia, business and community.

At the national level, NS defines priorities associated with the national fields of smart specialization, mainly correlated with the business needs and priorities of the

Strategic Research Agenda, aimed at responding to societal and technological challenges with innovative solutions. Basic research occupies a special place, through its ability to support the thematic priorities of the Strategic Agenda. NS financing will aim to maximize synergies between national and complementary RDI funding programs, structural and investment funds, the National Recovery and Resilience Plan, European and international research and innovation programs, private investments.

The National Research, Development and Innovation Plan 2022-2027 (NP), approved by Government Decision no. 1188/2022 is the main instrument for implementing NS. Through the 10 programs financed from the state budget, NP aims to ensure a transparent and predictable framework for investments in RDI, in order to modernize, consolidate excellence and increase relevance for the economy and society. All funded programs and activities are compatible with the sustainable development goals and are guided by the principles of impact orientation, predictability, multi-actor collaboration, European and international partnerships, open science, ethics and responsible research and innovation.

Let's keep up with science and the future we want!

NS expresses the firm option to support, recognize and reward excellence in basic and applied research, to stimulate the development of collaboration between the public and private actors, to address economic and societal challenges, to make science, innovation and innovation-based entrepreneurship successful models for the sustainable development of Romania in a local, national and international context.

Vision —•

Romania develops, concentrates and connects excellence to the scientific frontier and societal challenges.

- Percentage increase in the share of doctoral graduates in the number of higher education graduates by 10% until 2030.
- Annual increase of 0.12 researchers per thousand employees, which means an evolution from 2.0 researchers today to 3.2 researchers by 2030.
- Increase in the number of researchers working in Romania in 2030 by 20%.
- Increase in the number of articles* proportional to the number of researchers.
*Web of Science Index
- Scientific productivity increases from 0.85 to 1 article per researcher.
- Increase in the proportion of articles in the top 10% most cited, from 7% currently to 10% by 2030.
- Increase in the proportion of articles in the top 1% most cited, from 0.4% to 0.6% in 2030.
- Increase in the number of triadic patents by 50%.

There is a large mobilization of enterprises towards innovation.

- Romania will progress from the status of an emerging innovator to that of a moderate innovator, according to the European Innovation Scoreboard.
- The share of enterprises introducing new innovative products to the market will increase from 2.9% to 6%.
- The share of innovative enterprises collaborating with research organizations will be over 7%.
- The number of public-private co-publications per 1 million inhabitants will increase from 24.5 to 50.
- Employment in innovative enterprises will increase from 2.6% to 5%.

Innovation ecosystems associated with smart specializations support the advance in the global value chains.

- The growth rate of employment, value added and exports in the ecosystems associated with the areas of smart specialization benefiting from major projects will be twice the national average.

Internationalization and European and international collaboration

- Doubling the amounts attracted from the Horizon Europe Program in relation to the funds attracted from Horizon 2020.
- The annual number of international scientific co-publications per million inhabitants will increase from 284 to 600.
- Minimum 5% of national public funding for R&D, allocated for joint programs and for European partnerships, including interregional investments in EU projects.
- Bilateral collaborations are complementary to these interventions and contribute to the development of the capacity to create professional networks.

2030

STRATEGIC OBJECTIVES



1. Development of the research, development and innovation system

- 1.1. Increasing the number and scientific skills of researchers in the RDI ecosystem in Romania by training and attracting research talents.
- 1.2. Ensuring the transition to open science and facilitating the advancement of excellence in scientific research.
- 1.3. Increasing the competitiveness of research organizations.
- 1.4. Modernization and efficient use of R&D infrastructure by facilitating open access and ensuring its sustainability.
- 1.5. Connecting research and innovation activities with societal challenges - Strategic Research Agenda.



2. Sustaining the innovation ecosystems associated with smart specializations

- 2.1. Supporting and encouraging involvement in smart specialization projects and capitalizing on results.
- 2.2. Supporting smart specialization at the regional level.



3. Mobilization towards innovation

- 3.1. Supporting and encouraging collaboration between research organizations and the private sector for involvement in innovation projects and capitalizing on results.
- 3.2. Development of technological and knowledge transfer at the national level to increase the visibility of results and impact in the economic environment.
- 3.3. Supporting innovation entrepreneurship.



4. Increasing European and international collaboration

- 4.1. Increasing participation in European Union programs in the field of RDI. Synergies with Horizon Europe and other RDI programs coordinated at European and international level.
- 4.2. Development of bilateral/multilateral collaborations for RDI and RIS3.
- 4.3. Support for participation in European and international projects in order to strengthen the capacity of RDI actors.

IMPLEMENTATION TOOLS

Budget allocated to NS 2022-2027

≈16.617

Implementation tools for the National Strategy for Research,
Innovation and Smart Specialization 2022-2027

mil. euro

The National Plan for Research, Development and Innovation IV



The Operational Program Smart Growth, Digitization
and Financial Instruments



The Regional Operational Program(s)



The programs of the Romanian Academy



Health Operational Program



The National Recovery and Resilience Plan



Just Transition Operational Program



The Sectoral Plans of the Ministries



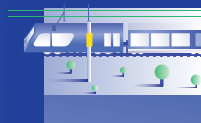
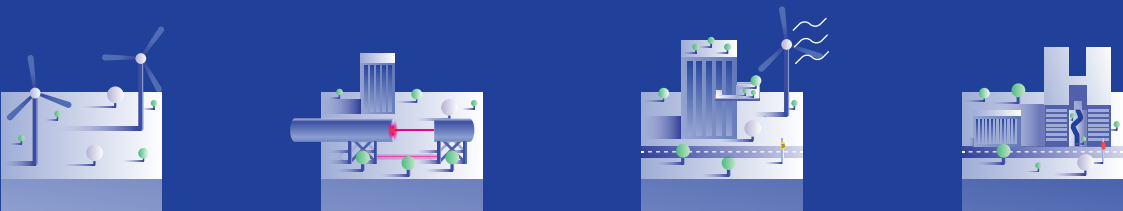
The Operational Program Education and Employment



The Programs of the Romanian Academy of Scientists



SMART SPECIALIZATION DOMAINS AT THE NATIONAL LEVEL



Part of the EU Cohesion Policy, Smart specialization is an approach characterized by the identification of strategic areas of intervention based both on the analysis of the strengths and of the economic potential, and on an Entrepreneurial Discovery Process with a wide participation of interested parties.

Romania opted to define smart specialization domains both at the national and the regional level. At the national level, smart specialization targets mainly, but not exclusively, technologically intensive domains (technologies of the future) for which the national dimension of collaboration is important and which have the potential to create spillover effects in the economy and society.

In the preparatory phase, the Entrepreneurial Discovery Process at the national level included various analyzes of

economic domains with promising potential and the identification of global technological trends, which were consolidated through large consultations in 2021. This process included panel meetings attended by more than 100 representatives of the key actors and two argumentative online consultations, each with over 2800 respondents from academia, business and civil society.*

The criteria used in the selection of specialization areas domains included: The presence and current interest of the relevant business players in Romania (40%); Global dynamics of the field (20%); The current national research and development capacity that can support innovation (20%) and The expected socio-economic impact in Romania (20%).

● 1. Bioeconomy

- 1.1. Technologies for the blue economy
- 1.2. Seed and Breed Improvement
- 1.3. Technologies for organic farming, agroecology and forestry
- 1.4. Agriculture 4.0
- 1.5. Safe and sustainable food for a healthy diet

● 2. Digital economy and space technologies

- 2.1. Microelectronic devices and systems for smart products
- 2.2. Future networks, communications, the Internet of Things
- 2.3. Technologies for the space economy
- 2.4. XR technologies
- 2.5. Artificial intelligence systems
- 2.6. Cyber security
- 2.7. Technologies for traceability
- 2.8. Robots and cognitive agents

● 3. Energy and mobility

- 3.1. Green mobility
- 3.2. Modern energy generation technologies with low or zero emissions
- 3.3. Digitization in energy
- 3.4. Energy storage

● 4. Advanced manufacturing

- 4.1. Manufacturing technologies for the aeronautical industry
- 4.2. Digitization and robotization of manufacturing
- 4.3. Advanced manufacturing technologies

● 5. Advanced functional materials

- 5.1. Optoelectronics
- 5.2. Smart composite materials
- 5.3. Recyclable materials and technologies for material recycling
- 5.4. Materials for electronic, electrical, photonic, magnetic and sensor applications
- 5.5. Biocompatible materials
- 5.6. Materials for energy

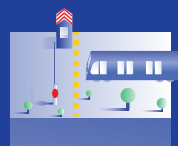
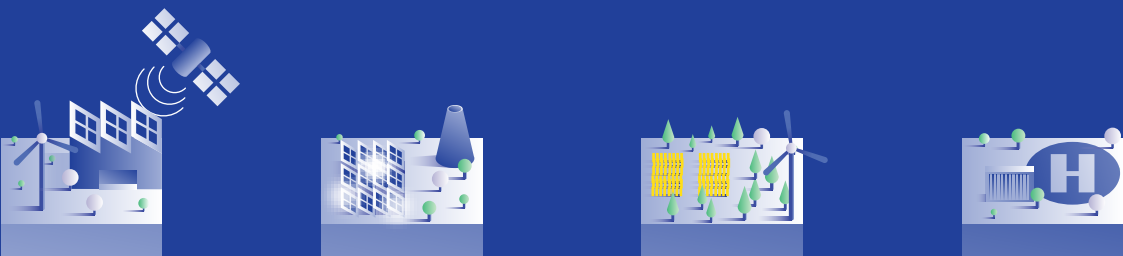
● 6. Environment and eco-technologies

- 6.1. Technologies for environmental management, monitoring and de-pollution
- 6.2. Technologies for the circular economy

● 7. Health - prevention, diagnosis and advanced treatment

- 7.1. Precision surgery
- 7.2. New generation diagnostic-therapeutic nuclear technologies
- 7.3. Longevity medicine
- 7.4. Early diagnosis
- 7.5. Technologies for an autonomous life
- 7.6. eHealth
- 7.7. Personalized medicine and genomics
- 7.8. Technologies for wearable systems

THE STRATEGIC RESEARCH AGENDA



The Strategic Research Agenda is intended to connect research and innovation activities with major societal challenges.

By focusing on societal impact, the Strategic Research Agenda is distinct and sometimes complementary to smart specializations. Also, the Agenda aims to guide basic research, the support of which must be primarily based on the criteria of scientific excellence.

In 2021, there was an extensive consultation process regarding the definition of the Strategic Research Agenda, which involved 150 representatives of key actors participating in panels and 2353 respondents in online consultation. The result of this consultation is a set of six areas targeting societal challenges, each with associated impact areas with extensive descriptions. 32 impact areas were identified.

● 1. Digitization, industry and space

- 1.1. Open strategic autonomy in digital and emerging technologies and their human-centeredness;
- 1.2. Regionally and globally attractive, secure and dynamic, data-agile economy;
- 1.3. Clean industry, circular economy and security of supply of raw materials;
- 1.4. Open strategic autonomy in the development, deployment and use of global space infrastructures, services, applications and data.

● 2. Climate, energy and mobility

- 2.1. Transition of the energy sector towards climate neutrality and resilience;
- 2.2. Accessibility, supply and efficient use of energy;
- 2.3. Towards a neutral and climate-resilient and environmentally friendly mobility;
- 2.4. Intelligent mobility systems;
- 2.5. Behavioral transformations to reduce the climate footprint.

● 3. Food, bioeconomy, natural resources, biodiversity, agriculture and environment

- 3.1. Increasing the relevance of forests in reducing pollution;
- 3.2. Agriculture's contribution to climate neutrality and resilience;
- 3.3. Biodiversity recovery, conservation and sustainable restoration of ecosystems and ecosystem services;
- 3.4. Circular bioeconomy;
- 3.5. Water resource management and sustainable development of fisheries and aquaculture;
- 3.6. Food and nutritional security;
- 3.7. Sustainable, balanced and inclusive development of urban, rural and coastal areas;
- 3.8. Innovative governance models that encourage sustainability and resilience.

● 4. Health

- 4.1. A healthy life in a society subject to rapid changes;
- 4.2. Living and working in a health-promoting environment;
- 4.3. Disease management and disease burden reduction;
- 4.4. Access to innovative, sustainable and high-quality healthcare;
- 4.5. New tools, technologies and digital solutions for a healthy society;
- 4.6. Developing an innovative, sustainable and competitive healthcare industry.

● 5. Culture, creativity and inclusive society

- 5.1. Democratic governance reinvigorated;
- 5.2. Development of cultural heritage, arts and cultural and creative sectors;
- 5.3. Social and economic resilience;
- 5.4. Inclusive growth and reducing vulnerabilities.

● 6. Civil security for society

- 6.1. Reducing losses caused by natural and man-made calamities;
- 6.2. Facilitating the mobility of passengers and the legal transport of goods, as well as prevention of illicit trade, piracy and other criminal acts;
- 6.3. Managing crime and terrorism more effectively and improving the resilience and autonomy of physical and digital infrastructures;
- 6.4. Increasing cyber security and maintaining a safer online environment.

1. IDEAS

- The platform for advanced studies and research
- Exploratory research projects
- Complex frontier research projects
- ERC-like research projects

2. HUMAN RESOURCES

SUPPORT

- Demonstration experimental projects
- Awarding Romanian journals for publishing under the open science regime
- Publishing with free access
- Protection of intellectual property rights

MOBILITIES

- Mobility projects for researchers
- Mobility projects for experienced researchers from the diaspora
- Mobility projects for young researchers from the diaspora
- Intersectoral mobility projects
- Senior mobility projects

START IN RESEARCH

- Doctoral scholarships for mobility abroad
- Postdoctoral research projects
- Research projects for young teams
- Research grants
- Marie-Sklodowska-Curie Certificates of Excellence
- The first job in the national RDI system

3. COMPETITIVE RESEARCH ORGANIZATIONS

- Institutional development projects
- Complementary institutional funding
- Projects to stimulate the voluntary integration of research organizations

**THE NATIONAL
RESEARCH, DE
AND INNOVAT**

4. THE NUCLEU PROGRAM

- Research programs of the National Research & Development Institutes

5. RESEARCH INFRASTRUCTURES

- Experiment voucher
- Services provided by research infrastructures
- Installations and special objectives of national interest
- Updating, developing and using existing research infrastructures
- Participation in European Research Infrastructure Consortia (ERIC) and ESFRI projects
- Participation in the European Open Science Cloud (EOSC)
- Accreditation/certification of testing and certification laboratories

6. CHALLENGES

Solutions

National Missions

Partnerships for the Strategic Agenda

- Challenges - Agile projects
- Challenges - Change projects
- Centers of excellence
- RDI for Cyber Security

Partnerships for competitiveness

- Demonstration experimental projects
- Transfer projects to the economic operator
- Bridge grant
- Innovation voucher
- Organization and development of innovative clusters
- Open innovation market

Innovative entrepreneurship and open innovation

- Innovative business matching fund
- Seed capital matching fund
- High-tech university competitions
- "Incubator" grant
- "Accelerator" grant

Innovative enterprises

- Pre spin-off
- Go to market
- Stimulating high-tech exports
- Patenting voucher
- 300+ entrepreneurs and innovators program

Technological transfer

- Training of technology transfer experts
- Twinning program
- Technological transfer festival
- Tech transfer fund

8. NATIONAL AND INTERNATIONAL COOPERATION

Horizon Europe subprogrammes

- Partnerships and European missions
- The Seal of Excellence
- Other co-financing or complementary financing actions
- Horizon Europe awards - Institutions and research teams

European and international initiatives

- EUREKA
- NATO
- Digital Europe
- Synergies with other European and international research programs
- European Defense Fund

The Bilateral/Multilateral Subprogram

- Mobility projects
- Complex bilateral/multilateral projects
- Collaboration with the Republic of Moldova
- Other types of international collaborations

Cooperation support

- Representation support
- Support organization of international events
- Support for National Contact Points

9. RESEARCH IN AREAS OF STRATEGIC INTEREST

- Technologies in the field of ultra-high power lasers ELI-NP
- Participation in international atomic and subatomic research bodies and programs
- Space Technology and Advanced Research - STAR
- River systems, sea, deltas - DANUBIUS
- IV generation reactors - ALFRED
- Blue economic growth at the Black Sea
- Quantum technologies
- Artificial intelligence
- Autonomous systems

10. SCIENCE AND SOCIETY

- Projects for training researchers in science communication
- Science in schools
- "Henri Coandă" projects
- Festival of science, creativity and innovation
- National Technical Museum
- Science and Technology Summer Schools
- Innovation in citizen engagement in science
- Exchange of best practices for developing the capabilities needed to implement open science
- Access to scientific literature
- National and international scientific events
- Subsidizing technical-scientific literature

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Project name

„Increasing the capacity of the RDI system to respond to global challenges.
Strengthening anticipatory capacity to develop evidence-based public policies”

Project code

SIPOCA 592
MySMIS2014 127557

Beneficiary

Ministry of Research, Innovation and Digitalization



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