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GUIDE TO THE SYSTEM OF PUBLIC SUPPORT FOR RESEARCH, DEVELOPMENT AND INNOVATION IN THE CZECH REPUBLIC – 2021

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FOREWORD

ČSNMT

The Czech Society for New Materials and Technologies was founded in 1993. Its mission is to advance the research, development and innovation in the field of new materials and processes, support industrial application of research and development and help the growth of its members, their creative potential and professional skills. CSNMT also promotes sharing of the outcomes of research and development and international cooperation in the field of materials and their processing. CSNMT is convinced that research, development and innovation belong to fundamental prerequisites for maintaining the competitiveness and fostering the development of the society and the Czech economy.

The initiator of this Guide was Ing. Tasilo Prnka, DrSc., an excellent scientist, specialist and populariser of nanotechnology research in the Czech Republic, one of the founders and the first president of the CSNMT. The Managing Committee of CSNMT has decided to launch this publication series, which will continue to remind us of his legacy.

COMTES FHT

The company COMTES FHT a.s. was established in December 2000 as a start-up focusing on research and development of metallic materials and their processing technologies. Since 2003, it has been operating as a research organisation according to the rules of the Community Framework. The mission of the research organisation COMTES FHT is to strengthen the competitiveness of Czech and European manufacturing companies by providing highly-specialised services for the development, innovation and implementation of state-of-the-art processes and products in practice.

COMTES FHT has successfully completed a number of research projects. Undoubtedly, one of the largest and most important ones was the “West-Bohemian Centre of Materials and Metallurgy” project under the RDIOP programme. Another major and successful project was funded from the EICOP programme and involved construction of a science and technology park and a business incubator adjacent to the company’s premises, enabling the company to procure new instruments and equipment and explore new themes in applied research. Current projects at COMTES FHT include COMEX, which is focused on research into advanced steels with unique properties, and GRAMATECH, pre-application research of functionally graded materials produced using additive technologies.

With more than a hundred employees, COMTES FHT offers comprehensive services in the research and development of metallic materials from their initial design, measurement of material properties, development and optimization of processing methods, design of tooling and manufacturing technologies to production and prototyping and certified testing. In these challenging times, COMTES FHT remains a reliable partner of research organisations and industrial companies around the world.

HISTORY OF THE GUIDE

In 1999, the Czech Society for New Materials and Technologies published the first Guide to the System of State Aid for Research and Development in the Czech Republic – 1999. This was the first time when detailed information on the programmes of state aid for research and development in the Czech Republic and on the support of international cooperation in research and development was compiled in a single booklet. After this first edition had been very well received, its later versions have continued to be published for twenty-three years, eventually under the title “Guide to the System of Public Support for Research and Development in the Czech Republic”. The Guide is updated every year to provide the most recent information and to reflect the current situation in research and development.

As the Czech Society for New Materials and Technologies and COMTES FHT firmly believe that research, development and innovation are the cornerstones of the modern society and prosperous economy, they have decided to jointly publish this Guide. Both organisations believe that it will become

a useful aid for not only the applicants for research and development funding but also for others interested in this field.

Table of content

INTRODUCTION

The “Guide to the System of Public Support for Research and Development in the Czech Republic – 2021” is the twenty– third publication in the series that has been published continuously since 1999. This year’s Guide has the same ambition as the very first one: to inform professionals as well as the general public about the options and ways of obtaining funding from support programmes for research and development and to give a summary of recent developments in this field.

The first edition was published in 1,000 copies. It was the first publication to provide comprehensive information on research and development in the Czech Republic from the perspective of international support as well as state aid. At that time, the ministries and offices which act as budget agencies in the Czech Republic differed greatly in their views of the government funding for research and development. Horizontal coordination of relevant programmes was practically absent, as was any integrated national research and development policy.

Since then, the system of research and development has undergone many changes on its long journey. In 2000, the first National Research and Development Policy was formulated. In 2002, the Support of Research and Development Act No. 130/2002 Sb. entered into effect and became crucial for shaping the future of Czech research and development (having been amended 23 times). In 2007, as the new version of the National Research and Development Policy was being prepared, deficiencies in the public support of R&D were identified of such proportions that they led to what became known as the Reform of the Research, Development and Innovation System. The Reform has transformed the management of research and development and innovation (RDI) at all levels, including the state administration, and changed the course of and upgraded the standards for Czech research and development. In 2012, the government adopted newly-formulated RDI Priorities, a document that identified research and development areas of key importance to the Czech Republic. In 2014, the Partnership Agreement between the Czech Republic and the EU for the 2014–2020 period was ratified. The same year, the European Commission adopted two important legal rules, the new Regulation No. 651/2014 and the new Framework for State Aid for Research, Development and Innovation. In 2017, the new Methodology of Evaluation of Research Organisations and Programmes of Specific-Purpose Funding for Research, Development and Innovation was approved by the government. In February 2019, the government approved the Innovation Strategy of the Czech Republic 2019 – 2030. In 2020, the new National Research, Development and Innovation Policy 2021+ of the Czech Republic was approved. The new framework programme, Horizon Europe, is to be finally approved in April 2021 to drive research in Europe and elsewhere until 2027. This is just a short list of the key documents which have shaped and will continue to shape research and development in the Czech Republic.

The system of research, development and innovation is changing continuously. Some of the changes are desirable, eliminating the consequences of ineffective interventions made in the past, whereas other changes arise due to external circumstances, such as the transposition of European regulations into Czech legislation. Other changes are due to the political scene, where each change in government automatically leads to the transformation of long-term R&D strategies. As a result, the system of thirty years still lacks the stability needed for planning for several years ahead, although long-term spending projections have been compiled for many years. This lack of certainty has an adverse impact on the management and results of research organisations and other organisations linked to research, development and innovation. This is one of the major obstacles that continue to hinder Czech research and its progress towards the European and global levels.
However, the challenge before us today is much greater than a mere uncertainty. The whole world has been facing the COVID-19 pandemic for more than a year. No one can predict future events or quantify the impact the pandemic will have on the budgets of the Czech Republic and other countries. Yet, it is certain that research and development will be affected. The nature of the impact is unknown. This booklet reports on the state of affairs as of March 2021, while some information may become outdated even in the same year.

As with previous editions, the 2021 Guide has been compiled using publicly accessible data and resources, and documents provided by the Research and Development Council and the budget agencies (public funding providers).

Summary and conclusions: Despite all the shortcomings in the RDI system, there are opportunities to secure funding for high-quality research projects and other research activities in the Czech Republic, to sustain and raise the standard of Czech research and development, and thus to close the gap on competitive European economies. The Czech Society for New Materials and Technologies and COMTES FHT are hopeful that this publication will become your guide on this path.

1. THE SYSTEM OF RESEARCH, DEVELOPMENT AND INNOVATION IN 2021

The sphere of research, experimental development and innovation (RDI) in Czechia has been hit by the COVID-19 pandemic. At the time this document was being compiled, it was unknown how long the lock-down would be, along with the other measures imposed by the Czech government. Their impact on government spending on research, development and innovation in this and the coming years was not clear either. The same holds for running and future public tenders, research projects and implementation of strategies for long-term development of research organisations, and other efforts. This 2021 Guide is based on documents which are often updated. The recommendation to the reader to verify the information using the references provided (websites of public funding providers and other public bodies) is therefore even more relevant than in previous years.
The RDI system in the Czech Republic may be characterized from a variety of perspectives, such as through the essential documents which provide its basic framework. These documents mainly concern the part of RDI funded by the government or, more precisely, funded from all public sources, such as the state budget, EU, and other public sources, including regional and municipal administrations. Since financing from multiple sources is a common practice, the publicly-funded RDI activities are closely linked to all other RDI efforts, whether those receive funding from domestic private sources or from abroad. A significant portion of non-public funded RDI also benefits from some form of state support, e.g. through tax incentives (deduction of research and development expenditures from the income tax base).

The system of support for RDI is described below in terms of eight aspects:

1. Conceptual and strategic (provided by the National Research, Development and Innovation Policy of CR),
2. Thematic focus (the Priorities of Oriented RDI),
3. Innovation (Innovation Strategy of the Czech Republic 2019 – 2030),
4. Legislative (the Support of Research and Development Act No. 130/2002 Sb., as amended, and the Framework for State Aid for RDI),
5. Financial (state budget for RDI, deduction of RDI spending, and other measures)
6. Assessment (Evaluation of Research Organisations and others),
7. Information (the RDI Information System),
8. Analytical (namely the Analysis of the Situation in Research, Development and Innovation in the Czech Republic and Comparison with the Situation Abroad).

1.1 National Research, Development and Innovation Policy of the Czech Republic

The document entitled The National Research, Development and Innovation Policy of the Czech Republic is approved at the government level. It outlines the main goals of the funding to be provided, the thematic focus, gives estimates of RDI spending from the state budget, the EU funds and private sources, and describes the priorities of applied research, development and innovation, and the measures for their implementation. It is a fundamental document that defines the orientation of the entire system for the next period.

Since 1994, there have been a number of predecessors to the current version of the policy. The following are a few examples from the recent period (after 2004):

- The National Research and Development Policy of the Czech Republic for 2004–2008
- The National Innovation Policy of the Czech Republic for 2005–2010
- Harmonisation of the National Research and Development Policy of the Czech Republic for the period from 2004 to 2008 with the National Innovation Policy of the Czech Republic and other relevant Czech and EU documents
- The National Research, Development and Innovation Policy of the Czech Republic for 2009–2015 – see section 1.1.1.
- The Update to the National Research, Development and Innovation Policy of the Czech Republic for 2009–2015 and Projection until 2020 (2013 Update to NRDIP) – see section 1.1.2.
- The National Research, Development and Innovation Policy of the Czech Republic for 2016–2020 and its update in 2019 – see section 1.1.2.

In mid-2020, National Research, Development and Innovation Policy of the Czech Republic 2021+ was approved. The document covers a period until 2027 (see section 1.1.4).

The drafting process for the new policy in 2007 revealed problems and shortcomings in the existing system of public support for R&D of such gravity that profound changes to the entire system were necessary. In response to them, the Research and Development Council (R&D Council) drafted the Reform of the Research, Development and Innovation System.
The Reform brought these fundamental changes:

1. In order to facilitate coordination and minimize the overlap of responsibilities, the number of public funding providers was considerably reduced (from 22 to 11).
2. The institutional funding, which is intended to foster the development of research organisations, was no longer allocated on the basis of assessment of general large research projects (known as “research plans”) but either on the basis of a comprehensive evaluation of the results produced by research organisations or based on an evaluation carried out by the public funding provider (the Academy of Sciences of the Czech Republic).
3. A significant portion of the responsibility for the specific-purpose funding for R&D was transferred from ministries and government offices to agencies: the Czech Science Foundation (GA CR) and the Technology Agency of the Czech Republic (TA CR); the latter was established by an amendment to Act No. 130/2002 Sb.
4. However, the ministries retained responsibilities for supporting four cross-sectoral and three sectoral areas.
5. Each of the four cross-sectoral areas is supported in its entirety: International Collaboration in R&D (Ministry of Education), Security R&D (Ministry of the Interior), Applied R&D of National and Cultural Identity (Ministry of Culture), Support of Large R&D Infrastructures (Ministry of Education).
6. The specifics of three sectoral areas made it impossible for the TA CR to provide effective support, in contrast to other sectoral R&D fields. These areas were therefore supported through competent ministries: Applied Agricultural R&D (Ministry of Agriculture), Applied Defence R&D (Ministry of Defence), and Applied Healthcare R&D (Ministry of Health).
7. Conditions and rules have been defined for establishing centres of excellence and for creating large infrastructures for R&D.
8. Aid rules have been determined and aid was provided for RDI from EU funds through operational programmes between 2013 and 2015. Research and Development for

Innovation (RDIOP), Entrepreneurship and Innovation (EIOP), Education for Competitiveness (ECOP), Prague - Competitiveness, Prague - Adaptability.

1.1.1 National Research, Development and Innovation Policy of the CR for 2009–2015

The National Research, Development and Innovation Policy of the CR for 2009–2015 was approved by Government Resolution No. 729 of 8 June 2009. It comprised the actual policy document, as well as the Priorities of Applied Research, Development and Innovation 2009–2011, and five annexes.

The National RDI Policy consisted of six inter-related parts:

1. Background to the NRDIP
2. Main principles of the NRDIP
3. NRDIP objectives and activities
4. Main principles of the NRDIP after 2015 (background, financial aspects, international aspects, and regional aspects)
5. Demands and ramifications (demands on legislation, state budget, and other requirements for the economy, society, and the environment)
6. The Priorities of Applied Research, Development and Innovation of the CR for 2009–2011

The Policy was arranged into 35 specific measures to meet nine objectives (the administrator of each objective is listed in the parentheses):

1. Establish strategic management of RDI at all levels (R&DC) – 4 measures
2. Focus the public funding of R&D on the needs of sustainable development (R&DC) – 2 measures
3. Improve the efficiency of the system of public support of RDI (R&D Council) – 5 measures
4. Apply the results of R&D to innovation and improve the public-private cooperation in RDI (Ministry of Industry and Trade (MIT), MEYS, and TA CR) – 10 measures
5. Strengthen the engagement of the Czech Republic in the international cooperation in RDI (MEYS, MIT, and AS CR) – 3 measures
6. Secure quality human resources for RDI (MEYS, MIT, and AS CR) – 3 measures
7. Create in the Czech Republic an environment which stimulates RDI (MEYS with MIT and AS CR) – 3 measures
8. Provide effective links to policies in other areas (R&DC) – 2 measures
9. Rigorously evaluate the RDI system (R&DC) – 3 measures

The document included the Priorities of Applied Research, Development and Innovation. The NRDIP and the Priorities of Applied Research, Development and Innovation are available in Czech at http://www.vyzkum.cz/ under the heading Dokumenty / Archiv - Národní politika VaVaI. In its National Reform Programme, the government committed to gradually increase the GDP share of public spending on RDI to eventually reach 1 % of GDP in 2020.

1.1.2 Update to the National Research, Development and Innovation Policy of the Czech Republic for 2009–2015 and Projections until 2020

The Update to the National Research, Development and Innovation Policy of the Czech Republic for 2009–2015 and Projections until 2020 (2013 Update to NRDIP) was approved by Government Resolution No. 294 of 24 April 2013. The same resolution required that the updated National Research, Development and Innovation Policy should be submitted to the government by 31 December 2015.

The 2013 Update to NRDIP covered several aspects to which the existing NRDIP had devoted limited space, such as innovation or the linking of educational, research and innovation activities together. Innovation was approached as an interactive process, wherein the interaction among the stakeholders in the RDI system, including the customers who are users of the resulting innovations, generates positive effects. The 2013 Update to NRDIP thus placed a greater emphasis on creating an environment and conditions for introducing innovations into the private and public sectors, and linking stakeholders together to encourage effective transfer of new knowledge and market stimuli.

1.1.3 The National Research, Development and Innovation Policy of the Czech Republic for 2016–2020 (NRDIP 2016)

The National Research, Development and Innovation Policy of the Czech Republic for 2016–2020 (NRDIP 2016) approved by Government Resolution No. 135 of 17 February 2016 aimed to provide favourable conditions for creating new knowledge, promote its conversion into innovation, and contribute to fulfilment of the vision. NRDIP 2016 focused on key areas, such as the management of the RDI system, the public sector of RDI, collaboration between the private and public sectors of RDI, innovation in enterprises, and RDI focusing. The document set strategic and specific objectives and defined relevant measures. The key to implementing NRDIP 2016 was to implement appropriate strategic management of the RDI policy, and efficient use of funds from the state budget and from European Structural & Investment Funds. One of the main planned steps was to establish a new Ministry for Research and Development (MRD) which would incorporate both the CSF and TA CR and assume a major portion of the R&D competences of the Ministry of Education. The MRD was to be established by a new bill on support for research, development and innovation which was intended to supersede Act No. 130/2002 Sb. However, this bill has never been passed into law.

NRDIP 2016 set the following strategic goals:

- Establishing a stable, effective, strategically-managed and financially viable system of research and innovation
- Creating a stable and high-quality sector of research organisations which are ready for and open to collaboration and knowledge sharing
- Setting up a system of cooperating enterprises, research organisations, public administration bodies and other stakeholders to provide new resources and knowledge for innovation
- Improving the innovation performance of enterprises in the Czech Republic by boosting research activities and introducing new technologies and procedures to improve the efficiency of business processes
- Strategically focusing the support for applied research on current and potential needs of enterprises and the society

Each of the strategic objectives was divided into specific objectives for which relevant measures were identified together with deadlines and responsible institutions.

To implement and finance the measures set out in the NRDIP 2016, maximum use was to be made of the European Structural & Investment Funds which are available to the Czech Republic in 2014–2020.

Another tool which contributed to the effective management of research, development and innovation and to the support for applied research on the national and regional levels was the National Research and Innovation Strategy for Smart Specialisation of the Czech Republic (National RIS3 Strategy) whose aim was to meaningfully channel the funding (from European, national and private sources) into the relevant sectors to support innovation. EU Member States were invited to develop their RIS3 strategies in order to identify promising areas of the economy to be supported from the ESIF. The RIS3 strategy of the Czech Republic reflected the priorities of the Czech economy to be supported by the ESIF programmes and the R&D support programmes of the MIT and TA CR. The first National RIS3 strategy of the Czech Republic was approved by Government Resolution No. 1028 of 8 December 2014. Its updated version was approved by Government Resolution No. 634 of 11 July 2016. The latest update to the National RIS3 strategy of the Czech Republic was approved by Government Resolution No. 24 of 11 January 2019.

Another change brought about by the NRDIP 2016 was an increase in the number of public funding providers from 10 to 14. The applied research needs of selected ministries were then listed in the information annex to the NRDIP 2016. In 2017, the Ministry of the Environment of the Czech Republic, Ministry of Transport, Ministry of Labour and Social Affairs and Ministry of Foreign Affairs began providing institutional funding to research organisations in their respective areas of competence (the previous provider in 2012–2016 was the Ministry of Education). Specific-purpose funding for these needs is administered under the BETA 2 cross-sectoral programme of TACR, focusing on the needs of state administration bodies which was launched by Government Resolution No. 278 of 30 March 2016.

Government Resolution No. 115 of 8 February 2019 approved Report on Assessment of Implementation of Measures Under National Research, Development and Innovation Policy 2016–2020 (the Report). The Report was compiled in response to the Government Resolution No. 135 of 17 February 2016 regarding NRDIP 2016. To maintain continuity, the new government maintained the measures until the end of the period of the national policy at the end of 2020. With some measures, it became necessary to update the tools for their implementation. This involved scrapping the plan to establish Ministry for Research and Development (as a central RDI administration office). Other measures were merged into one or split into separate steps. As a result, the Report also contained an update to the national policy for the period until the end of 2020. The update was developed in the context of the proposed changes to the measures.

1.1.4 The National Research, Development and Innovation Policy of the Czech Republic 2021+ (NRDIP 2021+)

In its Resolution No. 759 from 20 July 2020, the government approved the National Research, Development and Innovation Policy 2021+ (referred to as NRDIP 2021+), for 2021 – 2027 and decided that adoption of any other policy for the period beyond 2028 will be decided after evaluation of the goals of the existing policy in 2026. The main objective of NRDIP 2021+ is to build a dynamic innovative society. Specifically, the objective could be rephrased as the Czech Republic's shifting from the group of "moderate innovators", as classified on EU's Innovation Scoreboard, to "innovation leaders" and scoring above the EU average. The vision of NRDIP 2021+ is to boost the country's prosperity through knowledge and innovation-based economy using effective support for and effective focus of RDI. This includes good welfare and living conditions and recognition of the country as a partner to both European countries and those across the globe.

The main objective of NRDIP 2021+ is thus the same as that of the Innovation Strategy of the Czech Republic 2019 – 2030 (section 1.3). Although the documents overlap to some extent, NRDIP 2021+ focuses on innovation and mainly on research and development, which is reflected in its structure. NRDIP 2021+ comprises nine chapters:

- 1. Introduction (1.1 The Context of Development of NRDIP 2021+ and 1.2 The Focus of NRDIP 2021+)
- 2. Background to the Development of NRDIP 2021+ (2.1 Key International Documents and 2.2 Key National Documents)
- 3: Situation
- 4. Strategic Objectives
- 5. Measures
- 6. Priorities of Applied Research
- 7. Estimates of RDI Spending
- 8. List of Abbreviations
- 9. Glossary of Terms

The crucial section of NRDIP 2021+ is chapter 4 Strategic Objectives, which outlines five objectives:

- Objective 1: Establish a strategically-managed and effectively-funded system of research, development and innovation in the Czech Republic
- Objective 2: Support research organisations in building motivating working environment and developing their human resources across the research and development sector
- Objective 3: Enhance the quality of and achieve international excellence in Czech research and development, open and make the country more attractive for international research and development, and strengthen the integration of Czech RDI into European Research Area
- Objective 4: Expand the collaboration in research, development and innovation between the research sector and industry
- Objective 5: Ensure growth of research, development and innovation in undertakings and in the public sector

Each objective comprises four to eleven sub-objectives (themes) which provide further detail, such as "Develop legislation for new specific-purpose support tools for innovation and relevant processes, introduce systematic evaluation of specific-purpose support programmes, streamline the administration of RDI and secure open access to results of R&D in line with European legislation."
The fifth chapter deals with measures for implementing each sub-objective (theme). The information includes the title of the measure, its abstract, deadlines, the responsible person, indicators of completion, relationship to strategic objectives (some measures fall under multiple objectives or themes) and an indication whether the measure is a new one or related to Update to NRDIP.
The full NRDIP 2021+ and its appendices are available at the website of the R&D Council.

1.2 Priorities of oriented research, development and innovation

1.2.1 Long-Term Principal Research Directions

Until 2008, research and development priorities were referred to as "long-term principal research directions" (LTPRD). Despite all the effort, the LTPRD remained too broad, reflecting essentially all scientific (research) disciplines in the Czech Republic (7 directions).
The LTPRD used a single framework, comprising all seven thematic directions:

1. Sustainable development,
2. Molecular biology,
3. Energy resources,
4. Materials research,
5. Competitive engineering,
6. Information society,
7. Security research.

1.2.2 Priorities of Applied Research, Development and Innovation of the Czech Republic for 2009–2011

In 2008, the LTPRD document was reviewed. It was updated again in 2009, renamed as the Priorities of Applied Research, Development and Innovation of the Czech Republic for 2009–2011, and incorporated into the National Research, Development and Innovation Policy of the Czech Republic for 2009–2015. Due to requests for adding even more topics, the priorities failed to focus on those directions of research, development and innovation whose outcomes could be decisive for economic competitiveness and societal development. A majority of developed countries focus on between 3 and 5 priorities. By contrast, the Priorities of Applied Research, Development and Innovation of the Czech Republic for 2009–2011 had 8 priorities:

1. Biological and environmental aspects of sustainable development
2. Molecular biology and biotechnology
3. Energy resources
4. Materials research
5. Competitive engineering
6. Information society
7. Security and defence
8. Priorities of development of the Czech society

1.2.3 National Priorities of Oriented Research, Experimental Development and Innovation

The Priorities of Applied Research, Development and Innovation of the Czech Republic for 2009-2011 were substituted with new National Priorities of Oriented Research, Experimental Development and Innovation (RDI Priorities), approved by Government Resolution No. 552 of 19 July 2012.
Six Priorities have been defined, which are further divided into areas, sub-areas and sub-objectives. Their complete version can be found at http://www.vyzkum.cz/:

- Priority 1 – Competitive knowledge-based economy
- Priority 2 – Sustainable power industry and material resources
- Priority 3 – Environment for quality life
- Priority 4 – Social and cultural challenges
- Priority 5 – Healthy population

- Priority 6 – Secure society

The RDI Priorities build on not only the NRDIP objectives, but also the International Competitiveness Strategy 2 and the National Innovation Strategy 3, while reflecting the priority areas of the Horizon 2020 framework programme.

The Implementation of RDI Priorities was approved by Government Resolution no. 569 of 31 July 2013. The RDI Priorities cover the period until 2030 and are included in the Update to NRDIP. The Implementation of RDI Priorities requires that they are taken into account in the preparation of RDI programmes for specific-purpose funding. The RDI Priorities were also intended to inform the plan for EU Structural Funds for 2014–2020.

1.3 Innovation Strategy of the Czech Republic 2019 - 2030

The Innovation Strategy of the Czech Republic 2019–2030 (Innovation Strategy) was approved by Government Resolution No. 104 of 4 February 2019. It is a strategic framework plan which sets out the governmental policy for research, development, innovation and related areas, aiming to make the Czech Republic one the most innovative European countries in the next twelve years. The reasons behind formulating this strategy are summarized in its foreword: “Few countries have had so many strategic documents and visions as the Czech Republic. The problem is that the country has never been very good at following them. Political inactivity, lack of identification with the planned goals, narrow sectoral perspectives, overly complex action plans, and inadequate implementation skills of the responsible persons are the main reasons why the visions were not brought to life.”

1.3.1. Background and structure of the strategy

The Innovation Strategy is structured into nine pillars as shown in the schematic illustration below. Each of these pillars identifies the institution responsible, assigns managerial responsibility and presents the starting position, goals and tools for achieving them. With each pillar outlined on a single page, the strategy differs from its predecessors in its clear structure and conciseness. The Innovation Strategy includes an annex entitled International Comparison of the Innovation Environment in the Czech Republic, which gives an overview of the country’s innovation performance in terms of simple innovation indicators (knowledge intensity) and composite innovation indicators. The Innovation Strategy works with the three most well-known ones: the Summary Innovation Index (SII), the Global Innovation Index (GII) and the Innovation Output Indicator (IOI), which classify the Czech Republic as a moderate innovator, according to SII and as an average performer among the EU 28 (GII and IOI).

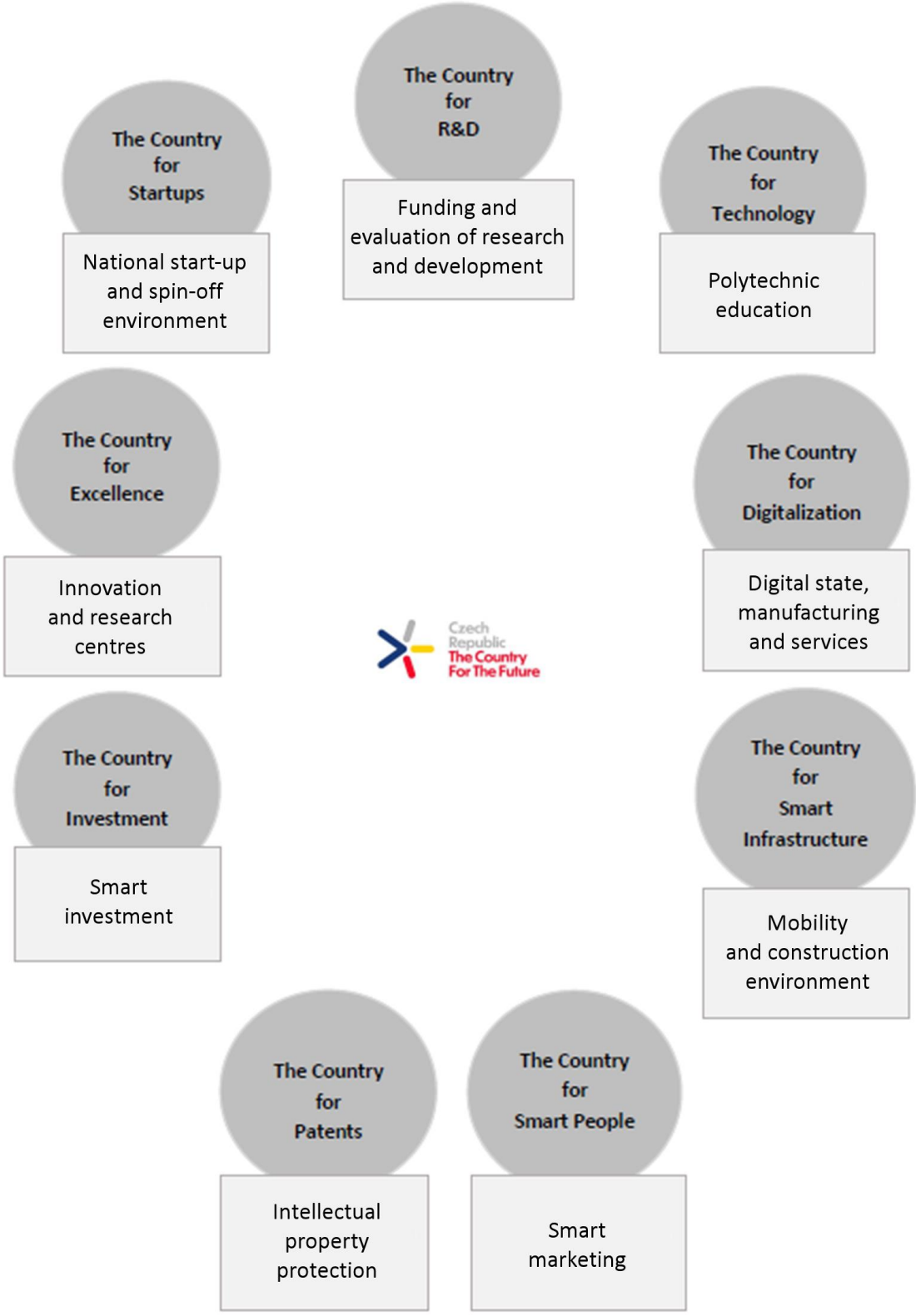
The first pillar of the Innovation Strategy, Funding and Evaluation of Research and Development, concerns the entire research, development and innovation system, and is therefore discussed below. The institution responsible for this pillar is the Research, Development and Innovation Council, while the managerial responsibility lies with a member of the Board of R&D Council. The starting position is described in terms of the share of total R&D and innovation expenditure in the Czech Republic being 1.79% of GDP, of which 60% comes from business resources, and 40% is provided from governmental and European resources. The weak points of institutional and specific-purpose funding are seen in the inadequate interrelationship and proportionality of the innovation chain: basic research → applied research → innovation → product → profit → reinvestment into research.

This pillar includes nine goals:

- raise the R&D funding (measured in % of GDP): 2020: 2.0 %, 2025: 2.5 %, 2030: 3.0%, i.e. growth of 0.1 percentage points each year; of which 1% would come from public resources and from businesses, 1.5% in 2025, and 2% in 2030;
- increase the institutional component of R&D funding for those research organisations that achieve excellent results related to defined research priorities;
- strengthen the specific-purpose support for institutions whose results find use in practice and for applied social sciences research;
- use evaluation tools to promote the orientation towards participation in Horizon Europe and maintain the availability of research funding from European funds;
- fully implement the assessment system based on Methodology 2017+, and monitor and continually review its effects with an emphasis on the impact on society;
- support those research topics which meet the following criteria: competitive basic research in global/disciplinary terms – sufficient capacity for follow-up applied research – successful application (new solutions for the quality of life, patents, licences sold, products) – relevance to the business environment and to fields with a potential for breakthrough technologies; in order to fulfil the primary goal of commercialization in final production based in the Czech Republic;
- achieve excellence in research and development by the standards of the European Research Council by 2030;
- encourage fundraising from non-public sources through financial instruments;
- simplify the conditions for and expedite the process of hiring foreign skilled staff.

Furthermore, the pillar includes seventeen legislative, financial and organisational tools for achieving these goals. At the time of preparation of this Guide, action plans with specific tasks were being developed for implementing the Innovation Strategy.
The other eight pillars of the Innovation Strategy have the same structure, as detailed on the website of the R&D Council.

Innovation Strategy of the Czech Republic 2019-2030 – structure



1.4 Legislation and legal regulations

The legal framework of the public support for RDI in the Czech Republic is provided by:

- Act No. 130/2002 Sb., on the support for research, experimental development and innovation from public funds and on changes to certain related acts (Support of Research and Development Act), as amended.
- The implementing instrument for Act No. 130/2002 Sb. is Government Resolution No. 397/2009 Sb., on the research, experimental development and innovation information system.
- Act No. 341/2005 Sb., on public research institutions, as amended,
- Act No. 227/2006 Sb. on research on human embryonic stem cells and related activities and on changes to certain related acts, as amended,
- Communication from the Commission: Framework for State Aid for Research, Development and Innovation (2014/C 198/01)
- Commission Regulation (EU) No. 651/2014 of 17 June 2014, declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty – General Block Exemption Regulation
- Act No. 586/1992 Sb., on income tax, as amended

All the above-mentioned and some other regulations are available in Czech at www.vyzkum.cz, the section Dokumenty.

Act No. 130/2002 Sb., on the support for research, experimental development and innovation (Support of Research and Development Act) was amended twenty-three times. The most recent version came to effect on 1 January 2022 (two amendments in Act Nos. 277/2019 Sb. and 484/2020 Sb.). Responding to this scope of changes, the Prime Minister promulgated in 2009 the full text of Act No. 130/2002 Sb. as Act No. 211/2009 Sb. Act No. 130/2002 Sb. was again amended by Act No. 420/2011 Sb., on changes to certain acts in relation to the enactment of the Act on the criminal liability of legal entities and proceedings against them. The 24th part of Act No. 420/2011 Sb. amended sections 7, 9 and 18 of the Support of Research and Development Act, and added the new section 14a concerning the qualifications of an applicant. Act No. 469/2011 Sb. altered the time limits for proposal submission and evaluation. Act No. 49/2013 Sb. brought changes concerning the bodies of the Czech Science Foundation and the Technology Agency of the Czech Republic. Furthermore, Act No. 194/2016 Sb. incorporated into national regulations some provisions of European legislation, namely Articles 107 through 109 of the Treaty (the “Treaty”) on the Functioning of the European Union, Regulation (EU) No. 651/2014 of 17 June 2014, declaring certain categories of aid compatible with the internal market, in accordance with Articles 107 and 108 of the Treaty (and equally Regulation (EU) No. 702/2014 regarding the agricultural and forestry sectors) and Communication from the Commission – Framework for State Aid for Research, Development and Innovation (2014/C 198/01). Act No. 194/2016 Sb. also established the List of Research Organisations, effective from 1 July 2017, where conditions and criteria are subject to the rules of administrative procedure of the Ministry of Education of the Czech Republic. Further amendments to Act No. 130/2002 Sb. resulted from Act No. 298/2016 Sb., Act No. 135/2016 Sb. and Act No. 367/2016 Sb. which altered other laws as well. Another major amendment to Act No. 130/2002 Sb. was brought by Act No. 146/2017 Sb. which updated the definition of eligible costs and cancelled the changes introduced one year earlier by Act No. 194/2016 Sb. Another change, in effect from 1 January 2019, was introduced by Act No. 367/2017 Sb. (amendment to budget rules), which maintained the continuity of the existing specific-purpose funding scheme, except for specific academic research, and therefore its exemption from some provisions of the Rules of Administrative Procedure, as opposed to institutional funding. The latest changes are those introduced by Act 277/2019 Sb. related to the Act on Collection of Laws and International Treaties and Act No. 50/2020 Sb. which came into effect on 12 March 2020 and reflected changes in institutional funding (ending the rigidly formal science assessment system known as “coffee grinder”) and the duty of large research infrastructures to deliver results.

Responding to the abundance of amendments and to the efforts to establish a Ministry for Research and Development, the R&D Council formulated the substance of a new bill in 2016 and, one year later, the actual bill on the support for research, development and innovation to supersede Act No. 130/2002 Sb. The substance of the new bill was approved by Government Resolution No. 719 of 24 August

2016 but failed to be passed into law, as the government resigned after the general elections. A major amendment or even a new law to govern the support for research, experimental development and innovation is envisioned as one of the tools of the Innovation Strategy. A major amendment to the Act is debated. It is intended to incorporate aid for innovation into the Act (as it is only referred to in the name of the Act), streamline administration in RDI and deliver a number of changes which have been long discussed. The amendment was approved by Government Resolution No. 1342 from 12 December 2020 and is now debated by the Chamber of Deputies (Parliamentary print No. 1118 of the parliamentary term VIII).

The implementing instrument for Act No. 130/2002 Sb. is Government Resolution No. 397/2009 Sb., on the research, experimental development and innovation information system, which identifies the data relevant to individual parts of the information system.
Act No. 341/2005 Sb., on public research institutions, as amended, has transformed a majority of the RDI institutions funded by contributions from the state budget to new legal entities. It has been amended nine times. It provides for the following:

a) The method of establishment, entry in the register, operation, methods of dissolution, and deletion from the register of public research institutions,
b) The positions and competences of the establishing entities, and of bodies of public research institutions,
c) The transformation of research institutions funded by contributions from the state budget to public research institutions.

Act No. 227/2006 Sb., on research on human embryonic stem cells, allows research on these cells to be conducted under transparent conditions. It also addresses importing and exporting embryonic stem cells and prohibits the export of embryos for research purposes. It has been amended nine times.

In 2014, the European Commission issued Regulation (EU) No. 651/2014 of 17 June 2014, declaring certain categories of aid compatible with the internal market in accordance with Articles 107 and 108 of the Treaty – General Block Exemption Regulation (GBER). GBER superseded Commission Regulation (EC) No. 800/2008 which declared certain categories of aid compatible with the internal market in accordance with Articles 107 and 108 of the Treaty (the earlier General Block Exemption Regulation). The European Commission thus permitted exemption from the notification requirement and, where applicable, shortening or even omitting the notification proceedings in research, development and innovation altogether, provided that the conditions of GBER were met, whereas these requirements are normally mandatory for any form of state aid for research, development and innovation.

On 27 June 2014, the European Commission issued a new Framework for State Aid for Research, Development and Innovation (2014/C 198/01) (Framework), which superseded the Community Framework for State Aid for Research, Development and Innovation (2006/C 323/01). The Framework governs the conditions for the operation of research organisations and their non-economic and ancillary economic activities which are compatible with the internal market of the EU.

In 2014, the GBER and the Framework led to several changes which were important to research, development and innovation in the Czech Republic, namely:

1) New definitions of terms in the GBER (Article 2, points 83–98), and in the Framework (point 15, paragraphs a–jj):

- Instead of the term “applied research” , the term “industrial research” is used,
- “Applied research” is therefore now defined as “industrial research, experimental development or their combination”,
- For the term “project”, objectives were specified as mandatory elements, for whose achievement all activities, costs and requirements must be stated in order for the (anticipated) results to be assessed and compared to the objectives,

- For “research and knowledge-dissemination organisations” (research organisations – RO), the scope of non-economic activities was expanded to include knowledge transfer, whereas the interpretation of “education” was narrowed to public education,
- “Knowledge transfer” now comprises predominantly research collaboration, consultancy, licensing, spin-off creation, publication, and mobility,
- “Collaborative research” subject to effective collaboration (between ROs or between an RO and an undertaking under the conditions of point 28 of the Framework) is now expressly defined as a non-economic activity,
- “Contract research” (research on behalf of undertakings) – provision of services, equipment lease, and other activities are expressly defined as economic activities,
- There is a new definition of the term “research infrastructure” which only applies to equipment, resources and services for research,
- “Exclusive development” means the public procurement of research and development services,
- “Pre-commercial procurement” is now defined as sharing the results between the contracting entity or authority and the provider (e.g. prototypes, test series, and others).

2) Increased notification thresholds (Art. 4, point 1, paragraph i) of the GBER):
- Two-fold increase (current levels: EUR 40 million for fundamental research, EUR 20 million for industrial research, and EUR 15 million for experimental development).

3) Incentive effect (Art. 6, point. 2 of the GBER, points 62–65 of the Framework):
- Simplification – with small and medium enterprises (SMEs), an application for funding prior to commencing the work is sufficient (section 14, paragraph 3 of Act No. 218/2000 Sb., on budget rules, sets out the elements of such applications), whereas large enterprises may be required by the public funding provider to provide additional information.

4) Aid intensity (Art. 7 of the GBER, points 73–77, 89, and Annex II to the Framework):
- A ratio of total public funding and total approved costs of the project (i.e. not just the proportion of the specific-purpose funding), formerly “aid rate”,
- The maximum basic aid intensity remains unchanged but the calculation method used for aid increase is modified slightly (for industrial research and experimental development in SMEs).

5) Cumulation of aid (Art. 8 of the GBER, paragraphs 83–93 of the Framework):
- Cumulation of aid is allowable from various R&D sources (including various projects and institutional funding for development of research organisations) and even from sources outside R&D (i.e. those governed by other Articles of the GBER).

6) Eligible costs (Art. 25, point 3 of the GBER, point 73a of the Annex I to the Framework):
- Specified mainly in terms of personnel costs (overhead costs should not include personnel costs directly related to the project).

7) Investment in research infrastructures (Art. 26, point 6 of the GBER):
- The aid intensity must not exceed 50 % of the eligible costs.

In response to the pandemic, the European Commission extended the duration by three years – until 2023. Details are available on the website of the Office for the Protection of Competition.

Research and development and its public funding are governed not only by the aforementioned rules but also by other related legislation which sets out limits for state intervention in competition (the Public Support Act No. 59/2000 Sb.), provides for public procurement, defines the status of state research organisations and the grant policy (Budget Rules Act No. 218/2000 Sb.), defines the status of the Academy of Sciences of the Czech Republic, establishes institutions of higher education, governs the rules of public administration information systems, and other matters. In addition, research and development are provided for by general legal rules for contractual relations, protection of industrial rights, provision of information, and auditing.

As of 1 January 2005, amendments to Act No. 586/1992 Sb., on income tax (Income Tax Act), introduced a deduction from the tax base equal to 100 % of expenses on R&D, i.e. approximately one quarter of the grant awarded to meet the total project costs.
Act No. 458/2011, which was due to take effect in 2015 as an amendment to this Income Tax Act, retained the support for R&D projects through the deduction of project costs from the income tax base (deduction of 100 % of costs) but introduced two key changes. Firstly, the deductible expenses can include those services for research and development projects which were provided by public higher education institutions or by research organisations. Secondly, the total deduction rate has been increased from 100 % to 110 % for expenses which increased over the previous period. The statutory measure of Senate No. 344/2013 Sb., which was passed in response to the new Civil Code, altered the provisions regarding tax deductions for research and development, and brought the effective date of the above Act forward to 1 January 2014. In 2017, the General Financial Directorate issued Information on research and development projects as a prerequisite for tax deduction for research and development support, pursuant to section 34, subsections 4 and 5 of the Income Tax Act, which stipulates the relevant project elements. The latest updates are available in the Guide to Notification of the intent to deduct support for research and development from the tax base under section 34ba of the Income Tax Act.

1.5 Budget for research, development and innovation

1.5.1 Draft budget preparation

The key player in preparing the initial draft of the budget for research, development and innovation is the Research and Development Council (R&DC). When it comes to the final draft, the decisive institutions are the Ministry of Finance, the government, and the Chamber of Deputies of the Czech Republic. Once the state budget is approved by the Chamber of Deputies, the Ministry of Finance allocates funds to individual budget agencies – the public funding providers.

The preparation of the draft budget takes place in stages (those described below apply to the RDI budget for 2020 which followed the conventional route, unlike the 2021 version affected by the pandemic):

1. In November (2018), the R&D Council approved the R&DC Guideline for Drafting State Budget Expenditure of the Czech Republic for Research, Development and Innovation for 2020-2022 with Projections until 2026.
2. In December (2018) the R&DC proposed to the funding providers the total spending on research, development and innovation for individual budget headings and the amount of institutional and specific-purpose expenditure for the period 2020 - 2022,
3. In January (2019), budget agencies, i.e. funding providers, submitted detailed proposals of spending for the coming year (2020) and draft medium-term projections for the next two years (2021 - 2022),
4. In February (2019), the R&DC and budget agencies discussed these proposals,
5. At the end of April 2019, the R&D Council approved a draft budget for circulation for comments from the ministries,
6. On 20 May 2019, Government Resolution No. 352 approved the draft of state budget spending on RDI for 2020, the medium-term projections for 2021 and 2022 and the long-term projections until 2026,
7. In September (2019) the government approved the state budget bill for 2020 (including the spending on research, development and innovation according to the Government Resolution from May) and presented it to the Chamber of Deputies.
8. The Chamber of Deputies debated the state budget bill for 2020 in the first reading), after which it was no longer possible to alter the overall spending and revenues. The bill was then debated in the parliamentary committees, which was followed by second and third readings, approving motions to amend the bill, enactment, signing into law by the president, and publishing as Act No. 355/2019 Sb. The total allocation for 2020 is CZK 36,247 million.

Once the budget was approved by the Chamber of Deputies, its items were specified in detail over one month, after which relevant funds were released to recipients in line with conditions of programmes and activities. In the field of research, development and innovation, the release of funds is conditioned on meeting the requirements stipulated by Act No. 130/2002 Sb., as amended. The main ones concern the beneficiary's fulfilment of its 2019 obligations from the running projects, and entering relevant data about projects and other RDI activities into the RDI Information System.
For running projects, Act No. 130/2002 Sb. stipulates a maximum time limit for providing the funds as 60 days from the start of the calendar year. With new projects and other activities, the 60-day period starts on the effective date of the contract or the grant award decision. If the beneficiary is in default of its performance, the public funding provider is entitled to enter into a contract with the next-ranking applicant entity. If the public funding provider is in default, the beneficiary is entitled to a compensation corresponding to the planned project costs for the period of the default.

In previous years, this standard procedure was delayed and the draft state budget for RID was submitted to the government at the end of June or in July. In 2010 and 2011, the government did not approve the draft budget submitted by the R&D Council. Based on a proposal by the Ministry of Finance, the government then defined the total spending on research, development and innovation in September in its state budget bill of the Czech Republic for the coming year. In 2012, the government approved the proposed RDI spending of the state budget for 2013 and the projections for 2014 and 2015 via its Resolution No. 458 of 26 June 2012. These expenditures were lower than those planned for 2012. However, in September 2012, the expenditures of the Academy of Sciences of the Czech Republic were increased in the course of the debate on the state budget bill for 2013. As a result, the total RDI expenditure of the 2013 state budget was CZK 26.1 billion, approximately CZK 0.5 billion less than in the previous year.
In 2013, the budget preparation process was even lengthier. The RDI expenditure proposal for the 2014 state budget with projections for 2015 and 2016 was approved by Government Resolution No. 518 as late as 3 July 2013. There was an increase for this period (i.e. 2013–2016) of CZK 2.1 billion. However, this proposal was subsequently revoked and substituted with Government Resolution No. 729 of 25 September 2013, On the State Budget Bill of the Czech Republic for 2014, and the Proposals of Medium-Term Projections for the State Budget of the Czech Republic for 2015 and 2016 and on the Revocation of Government Resolution No. 518 of 3 July 2013 on the Proposal of RDI Expenditure of the State Budget of the Czech Republic for 2014 and the Projections for 2015 and 2016. As a result, the state budget spending on research, development and innovation for 2014 was approved at CZK 26.6 billion.
In 2014, the proposed state budget spending on research, development and innovation for 2015 was again approved only as part of the state budget bill of the Czech Republic for 2015 and the medium-term projections for 2016 and 2017, reaching CZK 26.9 billion.
In 2015, the RDI expenditure proposal for the state budget for 2016 was approved by Government Resolution No. 380 of 25 May 2015. The RDI expenditure for 2016 was thus increased to CZK 28.6 billion, with a reserve of additional CZK 0.5 billion. By this 0.5 billion, the RDI expenditure of the state budget for 2016 was increased to CZK 29.1 billion through Government Resolution No. 748 of 23 September 2015.
In 2017, preparation of the draft of state budget expenditures on research, development and innovation for 2018 began relatively smoothly. The R&D Council draft was approved by Government Resolution No. 385 of 22 May 2017. Three weeks later, however, a proposal by the Ministry of Finance, which reduced the spending on RDI by CZK 1.8 billion, was approved by Government Resolution No. 442 of 14 June 2017 on the preparation of the state budget of the Czech Republic for 2018. Hence, two state budgets were developed simultaneously over the next three months, with all the difficulties arising from such a situation. It was the government bill on the 2018 state budget, which was approved by Government Resolution No. 674 of 25 September 2017, which merged both proposals. The core was the document from May, with some alterations from the June version.
In 2018, the draft of the Czech state budget spending on research, experimental development and innovation for 2019, the medium-term projections for 2020 and 2021 (and the long-term projections until 2025) were developed in a standard fashion, much as in 2019 when the Czech state budget spending on research, experimental development and innovation for 2020 was prepared along with projections for 2021 a 2022 and long-term projections until 2023.

Preparation of the draft of the Czech state budget spending on research, experimental development and innovation for 2021, the medium-term projections for 2022 and 2023 (and the long-term projections until 2027) were affected by the pandemic and some other factors. The proposal by the R&D Council was presented to the government as late as September 2020 when the state budget bill for 2021 was near completion. The government approved the state budget for RDI for 2021 – 2023 in its resolution No. 943 from 21 September 2020 and the rate of growth of RDI spending dropped (to approximately CZK 0.5 billion in 2021 and 2022 and to CZK 0 in 2023). Concurrently, the National Recovery Plan began to be developed which was to rely on EU funding (Recovery and Resilience Facility, RRF) (https://www.planobnovycr.cz/). The funds expected to be available from NRP for research, development and innovation for the period until 2026 are CZK 14 billion. Details are given in section 4.4.
Preparation of the draft of state budget spending on research, experimental development and innovation for 2022 and the medium-term projections for 2022 and 2024 has followed the conventional route, and three of the stages described above have been completed.

1.5.2 Structure of the RDI budget

The public funding of research and development has two forms:

Specific-purpose funding for research projects and other activities. Specific-purpose funding is provided by budget agencies through subsidies to legal or natural persons or through increased spending on organisational units of the state, organisational units of regional self-government units or organisational units of ministries engaged in research and development, in the following forms:

- **"Open-grants"** for basic research, i.e. funding for projects proposed by natural or legal persons, where the beneficiaries themselves determine the objectives and methods of investigation.
- **"Programme funding"** for applied research, development and innovation projects which meet the objectives of programmes designed and launched by public funding providers. The programmes are designed and announced by budget agencies, reviewed by the Research and Development Council, and approved by the government. Some of them support "projects for state administration", for which the desired results are defined by the state administration itself. Since the sole user of those results is the state, the public tenders are announced in accordance with Act No. 137/2006 Sb.,
- **Funding of specific academic research**, which is defined as research carried out by students in accredited doctoral or Master's study programmes in direct relation to their education,
- **Funding of large infrastructures for research, development and innovation**, where individual projects are approved at the government level.

Institutional funding for research organisations and other activities:

- **Long-term conceptual development of a research organisation** based on assessment of its results from 2018 (this includes funds being transferred from completed projects under National Sustainability Programme I).
- International cooperation of the Czech Republic in research and development on the basis of international agreements, which includes fees for the country's participation in international programmes and membership in organisations, as well as the funding of international collaboration projects where the projects are selected by the European Union or another international organisation (e.g. Horizon 2020),
- **Operational programmes in research, development and innovation**, or parts thereof, where the projects are selected through a competitive bidding process according to the GBER. The government expenditure on RDI is used for 15% co-funding of RDI-related operational programmes for which the European Commission provides the remaining 85% of public funding. In previous years, this arrangement was used for the RDIOP (MEYS) and, in modified formats, for the ECOP (MEYS) and EIOP (MIT) programmes. These operational programmes had ended (the last projects finished in 2015) and were replaced with the Research, Development and Education Operational Programme (RDEOP) administered by

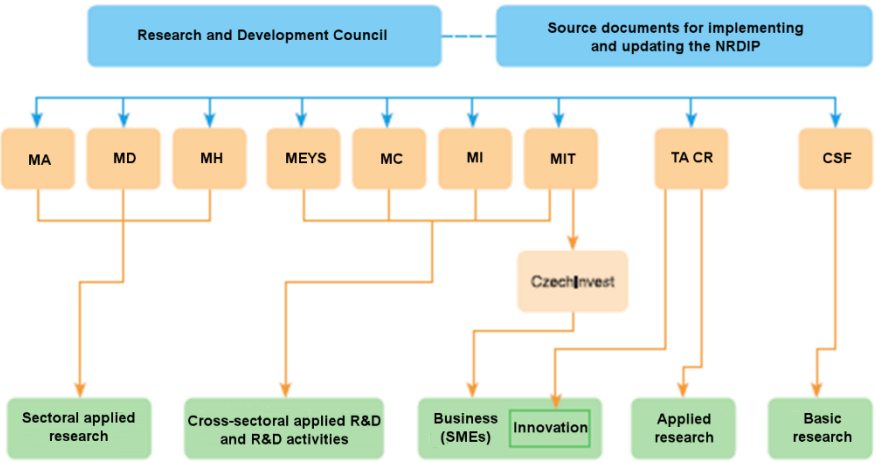
the Ministry of Education and the Enterprise and Innovation for Competitiveness Operational Programme (EICOP) of the Ministry of Industry and Trade.

- **Costs of the system of support for research, development and innovation**, namely the costs of public tenders and project evaluation, awards and other expenses, as well as the operating costs of the Research and Development Council, Czech Science Foundation, Technology Agency of the Czech Republic and the Academy of Sciences of the Czech Republic.

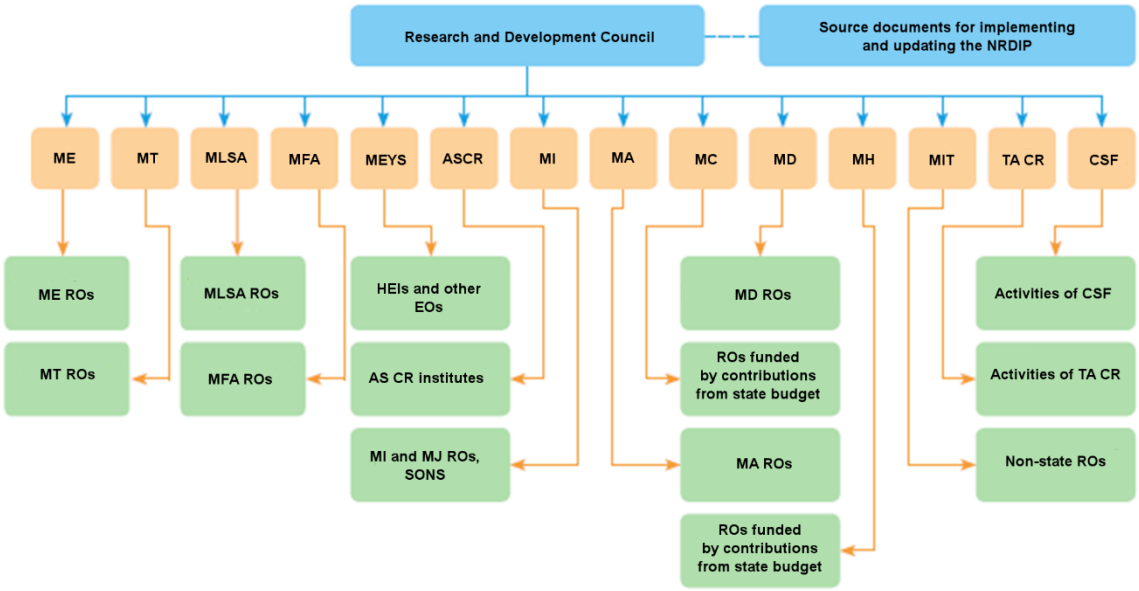
The institutional funding for development of research organisations follows certain conditions. From 2007, it was the Community Framework. As of 2014, it is the Framework for State Aid for Research, Development and Innovation. The funding is available to research organisations, i.e. all public and private legal entities, which meet the provisions of Act No. 130/2002 Sb., as amended. In relation to research organisations, these provisions require the following:

- The beneficiary's main purpose is to carry out basic research or applied research or applied development and they disseminate their results through teaching, publishing or technology transfer.
- Their profits are invested back in said activities.
- Preferential access to their research capacities or results is not available to entities engaged in economic activities consisting in offering goods or services, which could exert influence on the research organisation.

Specific-purpose funding for research and development and innovation



Institutional funding for research and development and innovation



1.5.3 Identification of research organisations

The decision on whether an entity meets the definition of a research organisation is the responsibility of the public funding provider, in accordance with Articles 107 and 108 of the Treaty on the Functioning of the European Union (TFEU) and the new Framework for State Aid for Research, Development and Innovation. The Research and Development Council has reviewed the fulfilment of the conditions. In early 2017, the Council published the latest List of Identified Research Organisations (reflecting the state as of 2 February 2017) (www.vyzkum.cz / Posuzování VO). On 1 July 2017, according to section 33 (a) of Act No. 130/2002 Sb., the MEYS began reviewing applications for entry in the list of research organisations on the basis of the rules of administrative procedure (the implementing instrument is government resolution No. 160/2017 Sb.), and therefore the Research and Development and Innovation Council finished the review. After 1 July 2017, all research organisation had to apply with the MEYS for registration in the list of research organisations and submit documents defined in the implementing instrument.

Until 2018, the amount of institutional funding allocated by the state budget to each provider's research organisations mainly depended on the results they had produced. In addition, these research organisations had to be identified as such by the R&D Council. From 2018 onwards, the additional funding beyond the 2016 amount is allocated on the basis of the evaluation of research organisations (although some public funding providers will adopt this arrangement no sooner than in 2019). Competent public funding providers now have the authority to decide on providing institutional funding for the development of research organisations.

1.6 Evaluation of results produced by research organisations

The evaluation of results produced by the research organisations which receive public funding only started after the year 2000. Evaluations before then typically took the form of "self-evaluation", if performed at all. The National Innovation Policy of the Czech Republic for 2005–2010 therefore called on the R&D Council to develop and continuously improve the methodology of research evaluation. A number of changes have been made since 2004, when the Methodology of Evaluation was drafted and used for the first time. The document, as well as the results of evaluations, is available in Czech at http://www.vyzkum.cz, in the "Hodnocení VaVaI" section.

The Methodology of Evaluation of Research Organisations and Results of Completed Programmes (for 2010 and 2011) did not differ significantly from the 2012 version. It provided for evaluating only those results which met the relevant definitions, the conditions for being entered in the Research, Development and Innovation Information System of the Czech Republic (RD&I IS), and which were actually entered in this system.

The 2012 Methodology had the following elements:

- No evaluation of the effectiveness of research organisations (ROs) was conducted.
- The evaluation of results only applied to those ROs which were eligible for institutional funding according to the rules approved by the R&D Council, and according to the current government-approved draft of state budget spending on RDI. Some ROs could have been added upon discussion on the draft budget for the coming year between the R&D Council and the public funding providers.
- The evaluation covered results applied in the previous five years, regardless of the funding source used for achieving them.
- In accordance with Act No. 130/2002 Sb., the evaluation also applied to new results which were entered in the Information Register of R&D Results (IRRDR) between 30 May of the previous year and 30 May of the year of evaluation, or until 29 May 2012.
- In accordance with the mentioned Act, the evaluation of results of completed programmes included results which had already been evaluated as results of ROs but were also related to the relevant programme, and the results produced by other beneficiaries under that programme which had been entered in the IRRDR within 250 days of the end of support.

The Methodology of Evaluation of Research Organisations and Results of Completed Programmes (for 2013–2015) was approved by Government Resolution No. 457 of 19 June 2013.

It relied on three interrelated pillars which brought about the following changes:

- **Pillar I: Subject-based evaluation of publications.** For each subject group, the methodology defined the relevant types of results and their maximum share of available points. This evaluation pillar comprised the so-called Subpillar I, which defined the peer review process and methods for selected types of results, e.g. books, chapters in books and articles in peer-reviewed journals without impact factor.
- **Pillar II: Evaluation of quality of short-listed results.** Its objective was to introduce a democratic principle, whereby each RO has the right to select and submit a limited number of results for expert evaluation. Within each subject group, an expert panel, planned to include a considerable share of foreign experts, selected no more than 20 % of those results to be awarded a special bonus. In addition, a special excellence bonus was awarded to those research organisations whose members succeed in obtaining project funding from the ERC (European Research Council).
- **Pillar III: Evaluation of patents and non-publication results of applied research.** As opposed to the previous practice where all non-publication results of research had been awarded fixed numbers of points, this rule only applied to patents. The point scores for all the other results depended on the amount of funding for applied research projects and on the volume of contract research.

In 2013, only Pillars I and III were to be applied to evaluation in full. Pillar II and the complete Sub-pillar I were to be implemented in 2014. The purpose of the 2013 transition period and the stepwise launch of the other pillars was to allow research organisations to prepare for this methodology without disrupting data collection processes that were running.
The final outcomes of the 2013 evaluation of research organisations were delayed. They were published on 30 May 2014 on the website of the R&D Council.
The R&D Council approved the outcomes of the 2014 evaluation on 18 December 2015 and subsequently published them (in Czech) at www.vyzkum.cz / section entitled “Posuzování VO”.

The evaluation of research organisations for 2015 and 2016 followed the updated Methodology of Evaluation of Research Organisations and Results of Completed Programmes. It is the one approved for 2013–2015, which was updated and extended for one more year, i.e. for 2016.

1.6.1. M17+ Methodology of Evaluation of Research Organisations and Programmes of Specific-Purpose Funding for Research, Development and Innovation

Over a long period of time, the R&DC has been developing a new system for evaluating research organisations and their institutional funding, drawing on the outcomes of a project entitled “Effective System of Research Financing, Development and Innovation” carried out as part of the IPN scheme (Individual National Projects) under the Research and Development for Innovation Operational Programme. The new Methodology of Evaluation of Research Organisations and Programmes of Specific-Purpose Funding for Research, Development and Innovation (M17+) was approved by the Government Resolution of 8 February 2017.
The goals of the M17+ are to provide input for effective management at all levels of the research, development and innovation system in the Czech Republic (the formative aspect), promote efficient use of public funds (the summative aspect), and improve the quality and international competitiveness of Czech research, development and innovation. It should inform decisions on institutional funding for long-term systematic development of research organisations (LSDRO) in line with relevant regulations, provide information for the management of the entire RDI system in the Czech Republic, data for funding providers, and support the decisions taken by the management of research organisations. The evaluation should also provide input into decisions on granting institutional funding for LSDRO, which is a motivational tool for improving the performance of ROs.

The fundamental principles of the M17+ are as follows:

1. **Three-level evaluation.** In the RDI system, every management level requires information at a different level of detail. The M17+ comprises the following three management and evaluation levels: the entire RDI system (the central authority is the R&D Council/Office of the Government), the funding providers, and the management of ROs. The M17+ is mainly devoted to the national level, and defines the methodology for public funding providers.
2. **Classification of ROs into three segments**. Based on their positions within the RDI system, and their missions, research organisations are divided into three segments for evaluation purposes: higher education institutions (HEI), institutes of the Academy of Sciences of the Czech Republic (AS CR), and the sectoral segment.
3. **Common framework for quality assessment of ROs**. M17+ introduces quality assessment across five basic evaluation modules for all types of ROs: M1 – Quality of selected results, M2 – Research performance, M3 – Societal relevance, M4 – Viability, M5 – Strategy and conceptual framework. The relative weights of modules shall reflect the position and mission of each RO in the RDI system. The modules constitute an evaluation framework which may be adapted at the funding provider level, and adjusted with respect to an RO's position in the RDI system.
4. **Evaluation frequency**. In the implementation period, annual evaluations on the national scale will mainly use the tools for M1 and M2 modules (bibliometric analysis or remote peer review in those disciplines where bibliometrics cannot provide relevant data for a review). Full-scale evaluation across all five modules will be in place by 2020. The target state expected to be in place beyond 2020 involves full-scale evaluations at five-year intervals.
5. **Three basic evaluation tools**. In individual modules, the ROs will be evaluated using bibliometric analysis, remote peer review and a review by a specialist panel. After the implementation period, members of the panels will also conduct on-site visits.
6. **Selection of ROs for evaluation**. Only those ROs will be evaluated which are listed in the Register of Public Research Institutions maintained by the MEYS. The evaluation will concern the results of ROs listed in the Information Register of R&D results.
7. **Specialist panels**. Research organisations will be assessed by six specialist panels according to the OECD classification fields (as outlined in the Frascati Manual): Natural Sciences, Engineering and Technology, Medical and Health Sciences, Agricultural and Veterinary Sciences, Social Sciences, Humanities and the Arts. The panels will be composed of experts in applied and industrial research and specialists from industry. Where appropriate and effective, the specialist panels will be composed predominantly from independent foreign experts. In their evaluation of selected results, the panels will rely on remote peer reviews, mostly by foreign reviewers, after considering whether their use would be appropriate and effective. Finally, the panel will propose classification of each result into one of five quality classes, provide substantiation for this proposal, and submit a general report.
8. **RO rating**. Full-scale evaluation across all modules in five-year intervals will lead to rating ROs on a four-level scale. The basis for the rating will be evaluations on the national level and on the level of public funding providers. The rating will be decided upon a discussion between representatives of the relevant public funding provider (where the public funding provider is not the founding organisation, a representative of the founding organisation will be invited as well), representatives of the R&D Council/Office of the Government of the Czech Republic, (vice-)presidents of the panels and possibly other invited experts. Results of the evaluation will be subject to approval by the R&D Council. A report will be compiled on the result of the entire evaluation of a particular RO and discussed with the RO prior to release. During the implementation period, the rating of the RO results will have indicative nature. The first long-term rating will take place in 2019.
9. **Implementation period**. The new methodology is being adopted gradually between 2017 and 2019. The evaluation will involve results applied in the previous year. 2019 will be the first year for research organisations to be evaluated using the complete M1 module and bibliometric analysis according to M2, and for the review panels to be composed of international experts. The evaluation will cover the results for the 2014–2018 period, using the evaluation outcomes from 2017 and 2018. ROs will be rated on the above-mentioned quality scale.
10. **Transition to five-year evaluation period.** The readiness for a full-scale evaluation differs considerably between various public funding providers and parts of the system. Some public funding providers completed evaluations at their level in 2017, others are to follow in 2018.

11. **Principles of LSDRO funding.** The funding for long-term systematic development of research organisations will consist of two components: the stabilisation component (the base) and the motivational one (the increment). In the implementation period, the base component will equal 100% of the LSDRO expenditure for 2016 divided according to the 2013–2016 Methodology. The motivational component, which will be at least equal to the year-on-year increase in the LSDRO funding, will be allocated on the basis of evaluation. The evaluation will lead to ROs' classification into four groups: A, B, C, and D.

Public funding providers performed evaluations of research organisations according to M17+ in 2017 and 2018 and published the results on their websites. National-level evaluations according to the first and second module out of the total of five modules have been published at R&DC for 2018. Evaluations for 2019 have been completed. They include publications and selected other results submitted by research organisations as of 15 October 2020. They are governed by instructions published on R&DC website. 2020 evaluation is expected to take place on similar dates.

On 30 July 2019, the government adopted resolution No. 563 which approved the Methodology of Evaluation of Research Organisations Among Higher Education Institutions. It is an update to the M17+ document as its Annex 5. The documents which relate to its implementation are on R&D Council website.

1.7 The Research, Development and Innovation Information System

The Research, Development and Innovation Information System (RD&I IS) is a public administration information system for collecting, processing, disseminating and using data on publicly-funded research, development and innovation.

The purpose and the content of the RD&I IS, its users' rights and duties, and the procedure for submitting, entering, processing and disseminating the data are set out in the Support of Research and Development Act No. 130/2002 Sb., as amended, in Government Resolution No. 397/2009 Sb., on the research, experimental development and innovation information system, in special legal regulations, and in the Operating Rules of the RD&I IS.

The RD&I IS is administered by the Research and Development Council. It is operated by the Office of the Government of the Czech Republic.

The RD&I IS consists of four interconnected registers (their Czech acronyms are listed as well):

- Central Register of Research, Development and Innovation Activities – CEA,
- Register of Public Tenders in Research, Development and Innovation (PTRDI) – VES,
- Central Register of Projects – CEP,
- Information Register of R&D Results – RIV,

and comprises VaVER (for beneficiaries) and RRoP (for funding providers) user interfaces, additional information (documents, classifications, data validation features, open data and API interface) and current information.

The RDI Information System which is operated by the Office of the Government is available at https://www.isvavai.cz/:

The landing page of the RD&I IS 3.0.2.

The main changes in the RD&I IS, launched in early 2018 included the following:

- New types/subtypes of results were introduced in accordance with Definitions of types of results (identified as: Jost, Ekrit, Enekrit, Sdb, NmetS, NmetC and NmetA), and definitions of some types of results (such as R), criteria for their application (e.g.: P) and the web-based checking service were updated,
- New data elements: field of research for the result/project, as defined by the OECD field of research classification – Frascati Manual 2015 and the field comparison table,
- Identifiers of persons – optional fields have been added for ORCID, Scopus Author ID and ResearcherID codes and periodical e-ISSN numbers,
- The R37 fields have been expanded from 1,024 to 3,000 characters, and the R42 and R46 fields from 2,000 to 10,000 characters,
- One data export option was added to the CEP module, reflecting the actual use of funds from the state budget,
- The funding allocated for the current year can be displayed in the CEA module.

On 20 February 2021, a new version was launched: RD&I IS 3.0.2. It offered a number of new features, a new web page design, tracking of record updates and broader search for results. Help desk services were expanded as well. All the changes are summarised on the website of the Research and Development and Innovation Information System.

1.8 Analyses of the Situation in Research, Development and Innovation in the Czech Republic

The documents entitled “Analysis of the Situation in Research, Development and Innovation in the Czech Republic and Comparison with the Situation Abroad” (RDI Analyses) have been prepared on a regular basis since 1999. From 2003, it is the R&D Council which compiles and submits them to the government every year. They are then published in Czech and English versions on-line and in printed form. RDI Analyses do not contain any proposals to eliminate the weaknesses or promote the strengths identified. They are, however, used as source documents for preparing important conceptual and strategic documents, namely the NRDIP. The analyses have repeatedly found slight improvements in RDI inputs and outputs in the Czech Republic, but also reported that the country was significantly and continuously lagging behind developed countries.

The nine chapters of the RDI Analysis 2019 contain a review and international comparison of the main RDI indicators of the Czech Republic.

Structure of the 2019 RDI Analysis

Summary
Interpretation part
1 Financial flows in research and development
- 1.1 Total expenditure on research and development
- 1.2 Financial flows among sectors
- 1.3 Direct and indirect support of research and development in the business sector

2 Funding the research and development from the state budget
- 2.1 Process of drafting the research and development part of the state budget
- 2.2 Categories of support for R&D in the Czech Republic and the structure of funding providers and beneficiaries
- 2.3 Specific-purpose funding of research and development by fields

3 RDI funding in the Czech Republic from European resources
- 3.1 Framework for RDI funding in the Czech Republic from ESIF Funds
- 3.2 Horizon 2020 framework programme

4 Implementation of the National Research and Innovation Strategy for Smart Specialisation of the Czech Republic
- 4.1 Characteristics of the National RIS3 Strategy
- 4.2 Funding, fulfilment of specific objectives and focus on application sectors reflecting the regional dimension
- 4.3 Regional aspects

5 Human resources in research and development
- 5.1 Numbers of employees in research and development
- 5.2 Numbers of researchers
- 5.3 Gender aspects

6 Research infrastructures
- 6.1 Legislative framework
- 6.2 Large infrastructures for research in Czech Republic
- 6.3 International research and development organisations established according to international public law
- 6.4 Response to SARS-CoV-2/COVID-19 pandemic

7 Results of research and development
- 7.1 Types of results and trends in their volumes
- 7.2 Quality of results and their international comparison
- 7.3 Licences

8 Innovation performance of the Czech economy and its international comparison
- 8.1 Innovation performance of the Czech Republic: basic indicators
- 8.2 Innovation performance: combined indicators
- 8.3 Innovation performance in Czech enterprises

9. International collaboration in research, development and innovation
- 9.1 Specific-purpose funding for international cooperation
- 9.2 Institutional funding for international cooperation

Conclusion
List of abbreviations
Annex

The summary of the RDI Analysis 2018 paints a positive picture of the evolution of the Czech RDI system, as indicated by several analyses and international comparisons. Fundamental indicators show a relatively favourable environment for RDI. This means that, in a long term, research and development expenditure has been growing, as well as the number of researchers.
The interpretation part of the report is very detailed. The conclusion presents a SWOT analysis and technical recommendations.

More detailed information can be found at:
http://www.vyzkum.cz/
https://www.vyzkum.cz/FrontClanek.aspx?idsekce=862351
https://www.czso.cz/csu/czso/prima-verejna-podpora-vyzkumu-a-vyvoje-v-ceske-republice
https://www.czso.cz/csu/czso/statistika_vyzkumu_a_vyvoje
http://www.statistikaamy.cz/category/analyzy/veda-a-vyzkum/

2. PUBLIC FUNDING OF RESEARCH AND DEVELOPMENT

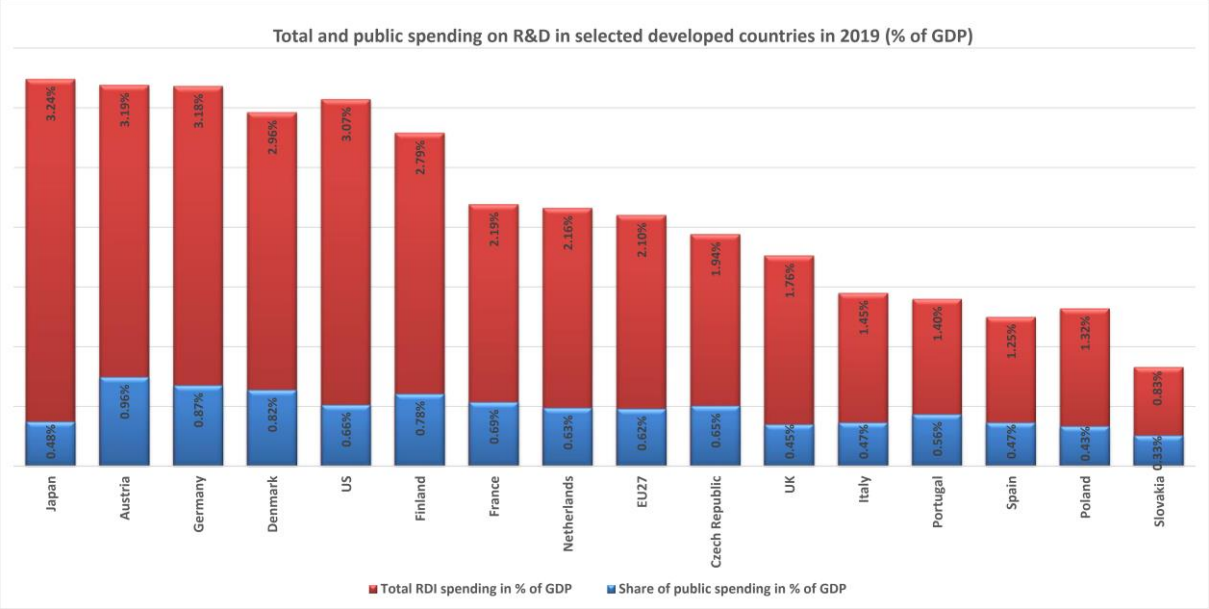
Direct public funding is the primary tool for implementing R&D policies in the Czech Republic and elsewhere. The amounts of total direct funding and public funding are among basic indicators for evaluating R&D in various countries. The EU as a whole is known to lag behind the USA and Japan, or Asian economies, in the amount of R&D spending. The Lisbon Strategy was adopted in 2000 with the objective of making the EU the most competitive global economy by 2010. In 2002, another R&D objective was announced in Barcelona: to increase the total R&D expenditure to 3% of GDP by 2010, of which one-third would come from public sources and two-thirds (2% of GDP) from private (business) sources. The EU has not achieved these objectives yet, and neither has the majority of its Member States.

The Czech Republic adopted the Lisbon Strategy as well, which has been reflected in documents that set the course of the country's R&D. The Czech Republic was closest to achieving the objective of the total R&D spending of 2% of GDP in 2014. This share has been continuously declining since 2014. In 2016, it was 1.68%, same as in 2011. Most of the investment which contributed to this came from private sources. In 2020, the country became closer to the 2% goal thanks to private and foreign sources.

In the coming years, the indicators will be affected by the coronavirus pandemic. Owing to the global GDP drop, the base decreases from which the percentage is calculated. These indicators will thus show more strongly whether and how fast R&D spending may shrink and whether it would correspond to the impact on the gross domestic product. In percent terms, the R&D spending-GDP ratio may even increase, if the amounts remain unchanged.

2.1 Total and public spending on R&D in selected developed countries

Total and public spending on R&D in selected developed countries in 2019 (% of GDP)



Source: OECD MSTI 2021/2
Note The shares of public spending in % of GDP for Germany, USA, France, Netherlands, EU27, UK, Italy, Spain and Poland relate to the year 2018. The data for Denmark are from 2017.

The year-over-year comparison has been affected profoundly by two facts. First, the United Kingdom left the European Union. As a result, the EU average value is now only calculated with data from 27 states. This fact alone caused the average ratio of R&D spending to GDP to increase, since the mean value for the UK was 1.7%, i.e. less than the 2% average for the entire EU.

The second fact was the coronavirus pandemic which cut the GDP in most countries. The EU27 GDP average dropped by 6.2%. For instance, the Spanish economy declined by 11%. With fluctuations this large, it is difficult to derive a year-over-year comparison because the same R&D spending makes up a greater proportion of the total GDP. Hence, the increasing ratios for some countries need not indicate more R&D funding but merely a slower slump when compared to GDP.

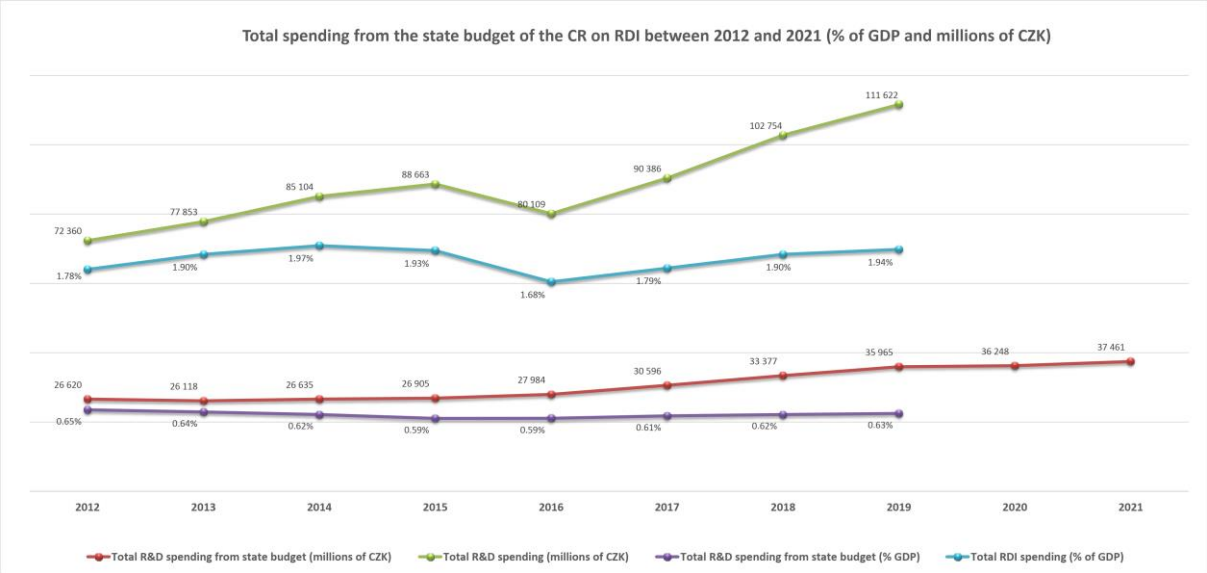
Only Austria, Sweden and Germany managed to exceed the first criterion of the Lisbon Strategy (total R&D spending worth 3% GDP). The EU average, which increased above 2% after a period of stagnation, was exceeded by France, Finland, Netherlands, Belgium and Denmark. In the last years, Denmark was repeatedly above three percent.

The second criterion (2% of spending coming from from non-public sources) is consistently met by no other country but Germany. The EU as a whole has not met any of these criteria yet, and neither has the Czech Republic. Of the selected countries referred to in this section, the United Kingdom, Italy, Portugal, Spain, Slovakia and Poland reported lower total spending on R&D than the Czech Republic.

A high share of private investment in R&D is typical of Asian countries, such as Japan. Although the share of private sources in the total R&D spending decreased to 79%, no EU country has even approached this level. Germany is the closest, with less than 65%

2.2 Total expenditure from the state budget of the Czech Republic on research, development and innovation

Total expenditure from the state budget of the CR on RDI between 2012 and 2021 (% of GDP and millions of CZK)



Source: Czech Statistical Office, state budgets of the Czech Republic for the given years

In the last three years, the Czech Republic's R&D spending was either the same or slightly increasing by several percent year on year. This increase barely covers inflation and certainly fails to reflect the average growth of salaries in the economy.

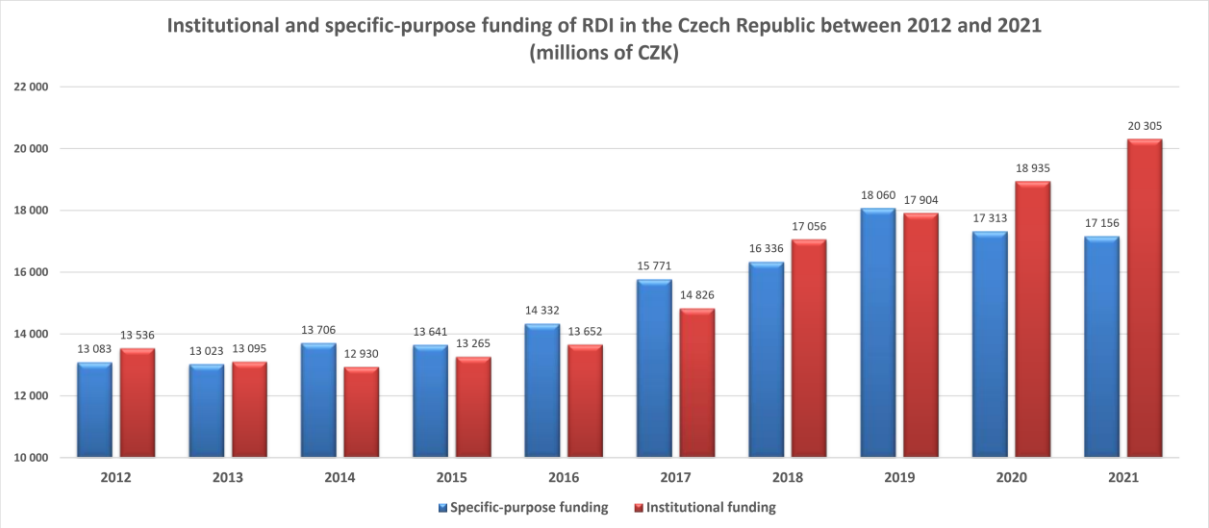
In fact, when expressed as a percentage of the GDP in recent years, the spending was stagnant until 2017 when it began decrease. This means that the increasing amount of R&D spending from the state budget until 2016 did not match the growth of the entire economy. In addition, the R&D share of the total spending has been decreasing since 2014. There was an upturn in 2017 but none of the proportional indicators returned to the levels seen in previous years. The main source of increasing total R&D spending in the Czech Republic in recent years was a growth of business sources. In 2019, it was almost CZK 65 billion, i.e. almost 2.5 times more than in 2010.

The state budget expenditures on R&D are not the only public sources available. Since 2007, Structural Funds of the EU have been gaining importance. This concerns mainly the Research and Development for Innovation and, to a lesser extent, the Education for Competitiveness and Entrepreneurship and Innovation Operational Programmes. More than CZK 100 billion from the EU resources was allocated for research and development under these three operational programmes until 2015. In 2015, these sources amounted to almost CZK 14 billion a year. However, in 2016 they were a mere CZK 2.7 billion. Since 2015, however, the newly-launched operational programmes Research, Development and Education (RDEOP) and Enterprise and Innovation for Competitiveness (EICOP) provided the necessary sources. In 2019 they reached CZK 8 billion.

Comment on the differences: As the OECD, the Czech Statistical Office and the state budget each rely on a different method of calculation, the absolute and relative values may differ.

2.3 Institutional and specific-purpose funding from the state budget for research, development and innovation

Institutional and specific-purpose funding of RDI in the Czech Republic between 2012 and 2021 (millions of CZK)



Source: State budgets of the Czech Republic for the given years

The total state budget spending on R&D is divided into two streams. The first is specific-purpose funding, and the second institutional funding.

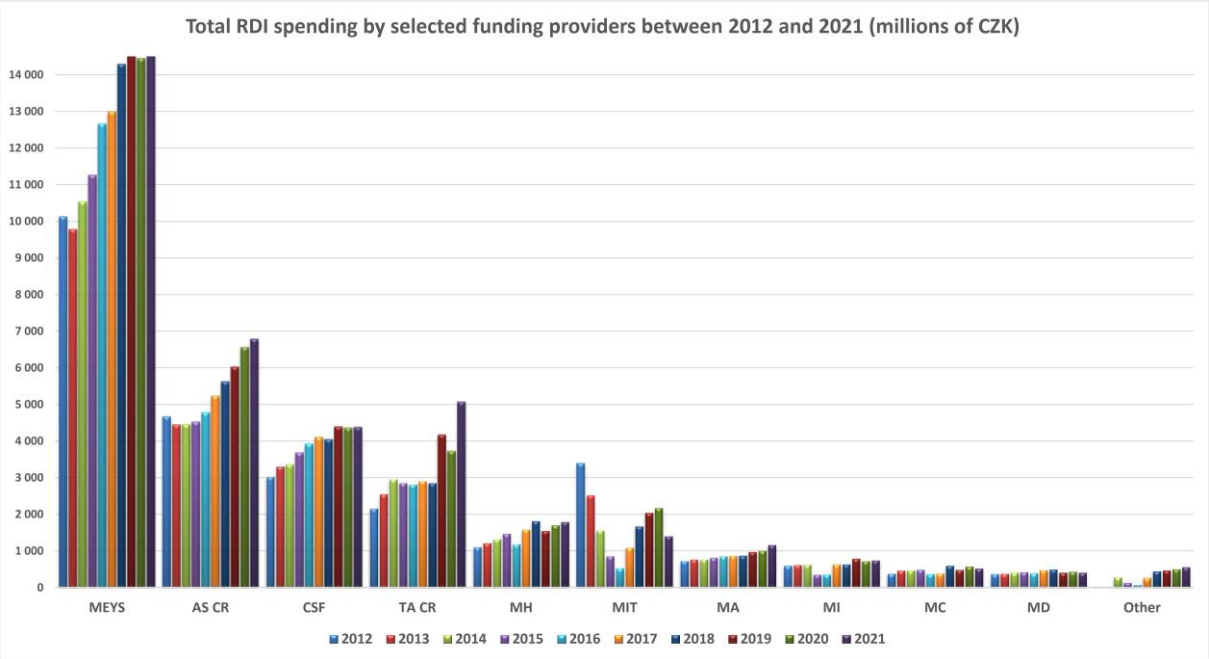
Specific-purpose funding is distributed predominantly through public tenders for selected research projects. These include open-grant projects, where the objectives and methods of basic research projects are determined by the researchers themselves. Then there are programme projects in applied R&D which aim to fulfil the objectives of a particular programme. Specific-purpose funding also goes to those research projects that fulfil the needs of the state (public research and development contracts). Finally, it is also provided for expanding R&D infrastructures and for specific academic research.

The dominant form of institutional funding provided to research organisations today is reimbursement of the costs of their development based on evaluation of their results., which includes the remaining funds transferred from the soon-to-end projects under the National Sustainability Programme I. Institutional funding is also awarded for certain activities in international R&D cooperation and as co-funding for operational programmes in RDI. Finally, institutional funding meets the costs of public tenders, evaluation procedures, and financial awards for extraordinary achievements, as well as the operating costs of the Academy of Sciences of the Czech Republic and other institutions. The ratio between institutional and specific-purpose funding in the Czech Republic cannot be compared to similar indicators abroad because their structures differ.

After 2001, institutional funding was higher than specific-purpose funding. In the past, the R&D Council strove to reduce the differences between them. Specific-purpose funding tends to be awarded on the basis of competition, whereas institutional funding is in fact often granted automatically, once the beneficiary meets certain basic conditions. 2014 was the first year when the amount of specific-purpose funding exceeded the institutional funding. Since 2020, the institutional component of the funding has increased, mainly as a result of the research aid from NSP programmes.

2.4 Expenditure on research, development and innovation by selected public funding providers

Specific-purpose funding of RDI by selected public funding providers between 2012 and 2021 (millions of CZK)



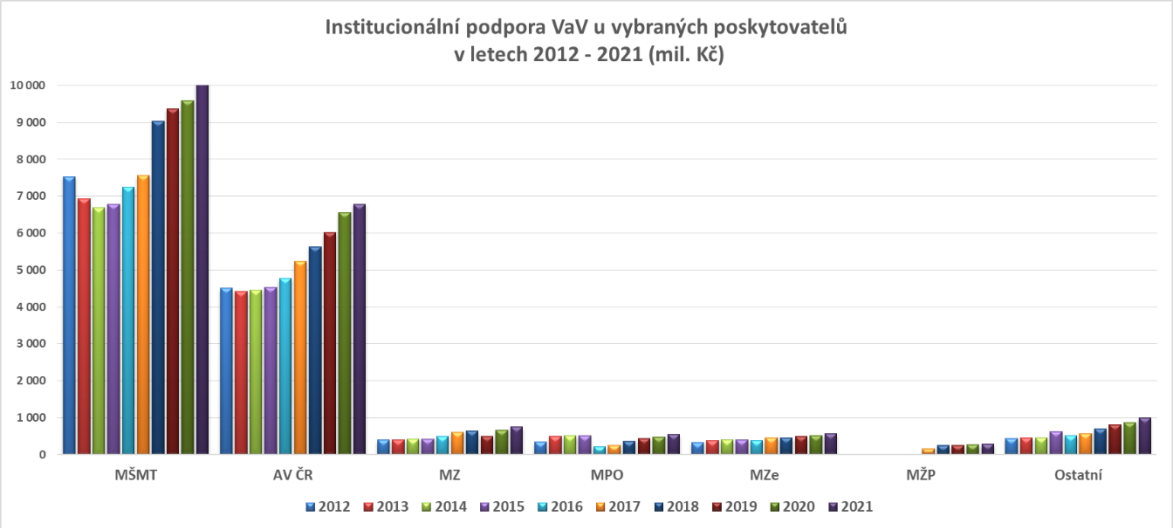
Source: State budgets of the Czech Republic for the given years

The graph shows the history of total funding from ten public funding providers. The data for four other providers – Ministry of Environment, Ministry of Labour and Social Affairs, Ministry of Transport and Ministry of Foreign Affairs – are indicated as “Other”.

The Reform of the Research, Development and Innovation System from 2008, which was approved by the government, reduced the number of state budget headings (and therefore the number of corresponding public funding providers) for R&D from 22 to 11. (The eleventh one, from which no external organisations are funded, is administered by the Office of the Government of the Czech Republic, and is used for funding the operation of the Research and Development Council.) In 2017, the number of funding providers rose to 14 (and the number of budget headings increased to 15); the institutional funding providers are, again, the Ministry of the Environment, Ministry of Transport, Ministry of Labour and Social Affairs and Ministry of Foreign Affairs.

2.5 Institutional funding of research and development by selected public funding providers

Institutional funding of RDI by selected public funding providers between 2011 and 2020 (millions of CZK)



Source: State budgets of the Czech Republic for the given years

The Reform of the Research, Development and Innovation System, which was approved by the government (Government Resolution No. 287 of 26 March 2008), fundamentally changed the way institutional funding was provided. Still running large research projects (referred to as “research plans”) were to be completed as planned, but no calls for new ones were to be announced. A new basis for granting institutional funding was chosen: the evaluation of research organisations according to government-approved methodology or, in the case of the Academy of Sciences of the Czech Republic, self-evaluation. Today, the Research and Development Council draws on the outcomes of this evaluation for drafting the state budget for RDI. (In the 2013–2015 period, the Council followed the principle of 20% allocation on the basis of evaluation scores, and 80% allocation on the basis of the previous year’s allocation. However, its RDI budget drafts were not approved in those years. Between 2016 and 2018, the R&DC’s draft built mainly on approved medium-term projections and on the outcomes of budget negotiations with individual public funding providers.)

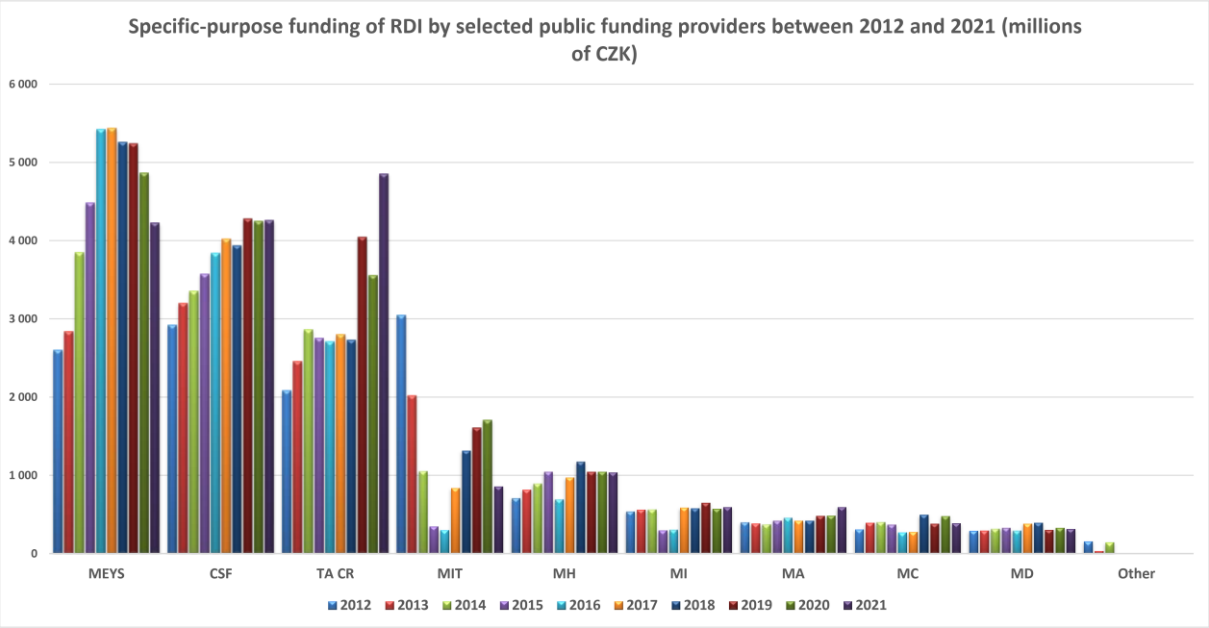
As mentioned above, institutional support is also provided for matching the funding of operational programmes in RDI. Finally, institutional funding meets the costs of public tenders, evaluation procedures, and financial awards for extraordinary achievements.

The lion's share of institutional funding is distributed by the Ministry of Education of the Czech Republic (MEYS) and the Academy of Sciences of the Czech Republic (AS CR). MEYS provides institutional funding to higher education institutions and to some research organisations. It also co-funds operational programmes in RDI AS CR provides institutional funding to its institutes. Therefore, the expenditures are not directly comparable.

Since 2017, the public providers of institutional funding are four ministries again (Ministry of Environment, Ministry of Transport, Ministry of Labour and Social Affairs and Ministry of Foreign Affairs). The Ministry of the Environment is the largest public funding provider and is listed separately in the chart. The remaining three of these new public funding providers are listed in the “Others” category, together with three others: the Ministry of Defence, Ministry of Culture and Ministry of the Interior. In 2021, they will distribute funding in the aggregate amount of CZK 993 million.

2.6 Specific-purpose funding of research, development and innovation by selected public funding providers

Specific-purpose funding of RDI by selected public funding providers between 2011 and 2020 (millions of CZK)



Source: State budgets of the Czech Republic for the given years

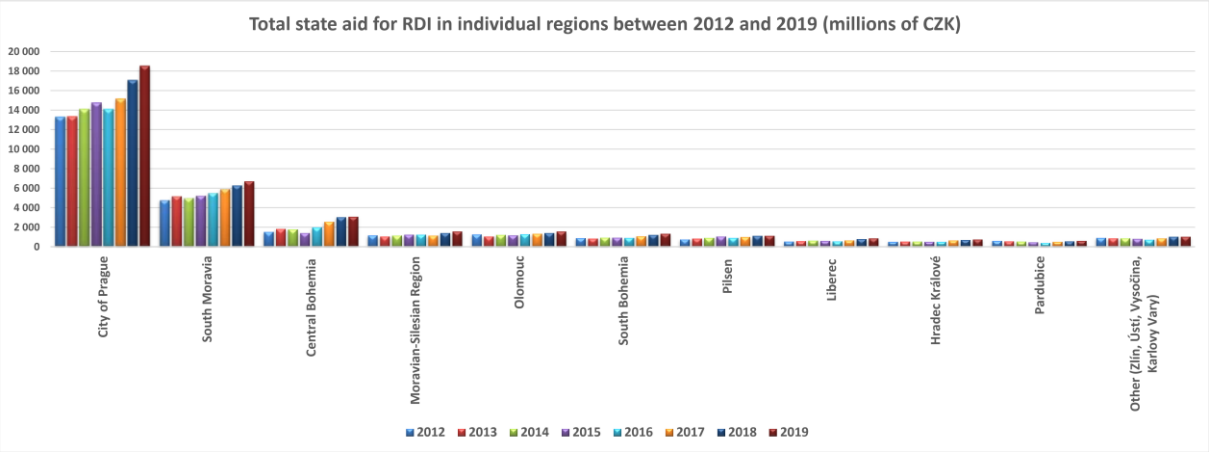
Specific-purpose funding for R&D is awarded for R&D projects upon public tenders. The Czech Science Foundation (CSF) provides funding for open-grant projects in basic research. Other public funding providers, including the Technological Agency of the Czech Republic (TA CR), support programme projects under their R&D programmes. The Ministry of Defence, Ministry of the Interior and the TA CR also award public contracts in R&D.

TA CR expenditures began to rise after it had taken over responsibility for several R&D areas previously administered by other budget agencies which ceased to provide specific-purpose funding for RDI. In 2021, TA CR is to become the largest specific-purpose funding provider. In the last year, TA CR took over a major portion of the applied research efforts from the Ministry of Industry and Trade.

The increase in the amount of funding under the state budget heading of the Ministry of Education (MEYS) after 2015 was due to the launch of the National Sustainability Programme I (NSP I), and the National Sustainability Programme II (NSP II). These programmes promote the sustainability of the new research centres established under RDIOP and Prague – Competitiveness Operational Programme (PCOP) and are coming to an end. Future funding will be available as institutional funding. As of 2016, substantial funds are available for individual projects of large infrastructures.

2.7 Total state aid for research, development and innovation in regions

Total state aid for RDI in individual regions between 2011 and 2018 (millions of CZK)



Source: CSO

The above figures for the total state funding of R&D include all specific-purpose funding that was provided in the relevant years. Of the other type of public funding, the institutional funding, only that for the former large research projects (referred to as “research plans”), and for the development of research organisations, has been included here. The funding of specific academic research and selected international cooperation activities in R&D was excluded.

In geographic terms, public funding is distributed rather unevenly across the territory of the Czech Republic, as in many other countries. This reflects the historical distribution of R&D facilities across the country. The capital city of Prague absorbs around 50% of the total public funding of R&D. Of the total fourteen regions, a mere four regions, including Prague, receive almost 80 % of the total funding. This trend has been stable in recent years. In fact, Prague will soon exceed the 50% threshold.

Establishment of new R&D infrastructures outside Prague was expected to mitigate these differences. This effort was funded by the EU under the Research and Development for Innovation Operational Programme. Yet, these steps have not altered the regional distribution of aid in any significant manner. This aid from operational programmes is only reported in the amounts provided from the Czech state budget – “co-funding”. As the amounts for the Zlín, Ústí, Vysočina and Karlovy Vary Regions were very low, they were added together and shown as a single item.

3 RDI PUBLIC FUNDING PROVIDERS AND PROGRAMMES IN THE CZECH REPUBLIC

3.1 Czech Science Foundation (CSF)

The Czech Science Foundation began its operations in 1993. One of its tasks is to award grants to the best basic research projects from all fields of science on the basis of annual public tenders in research where the objectives and project implementation methods are proposed by scientists themselves.. The projects lead to new knowledge of the underlying foundations of phenomena and observable facts which are published in a way that is customary in the discipline. Every year and for each project, the CSF reviews the progress and compliance with the objectives of the project. Finally, it evaluates the results of each completed project. The CSF acts as a budget agency, which means that it awards grants, i.e. specific-purpose funding for basic research projects, from a separate heading of the state budget.

Every year, about 3,000 proposers apply for funding from the CSF, of whom approximately one quarter succeed but the success rate varies from year to year.
CSF allocates funds for standard projects, JUNIOR STAR projects, EXPRO and international projects. In 2014, international "LA Grants" began to be awarded. From 2017, projects which support international collaboration for obtaining ERC grants will be supported. The first public tender for EXPRO projects for excellence in basic research was announced 2018. JUNIOR STAR, a new programme, has been launched in 2020.

<u>The activities of the CSF are as follows:</u>

- Prepares and conducts public tenders in research through which grants are awarded.
- Its expert consulting bodies evaluate project proposals, and select the best ones to receive funding.
- Awards grants within current financial limits, i.e. based on the allocation from the state budget, and makes contracts with applicant entities.
- Monitors the project progress and fulfilment of objectives through annual interim project reports.
- Evaluates the results achieved by the project, based on its final report.
- Reviews the project team's management of project funds, i.e. the purpose of expenses, and compliance with relevant regulations and requirements.
- Cooperates with foreign scientific bodies and institutions, in particular from the Member States of the European Community.

<u>Types of open-grant projects:</u>
The CSF provides specific-purpose funding for the following types of open-grant projects:

- Standard grant projects (GA)
- International (bilateral) projects (GC)
- Junior grants (GJ)
- LA grants (GF)
- Projects which support international collaboration for obtaining ERC grants (GH)
- EXPRO grants for excellence in basic research (GX)
- JUNIOR STAR (GM)
- POSTDOC INDIVIDUAL FELLOWSHIP

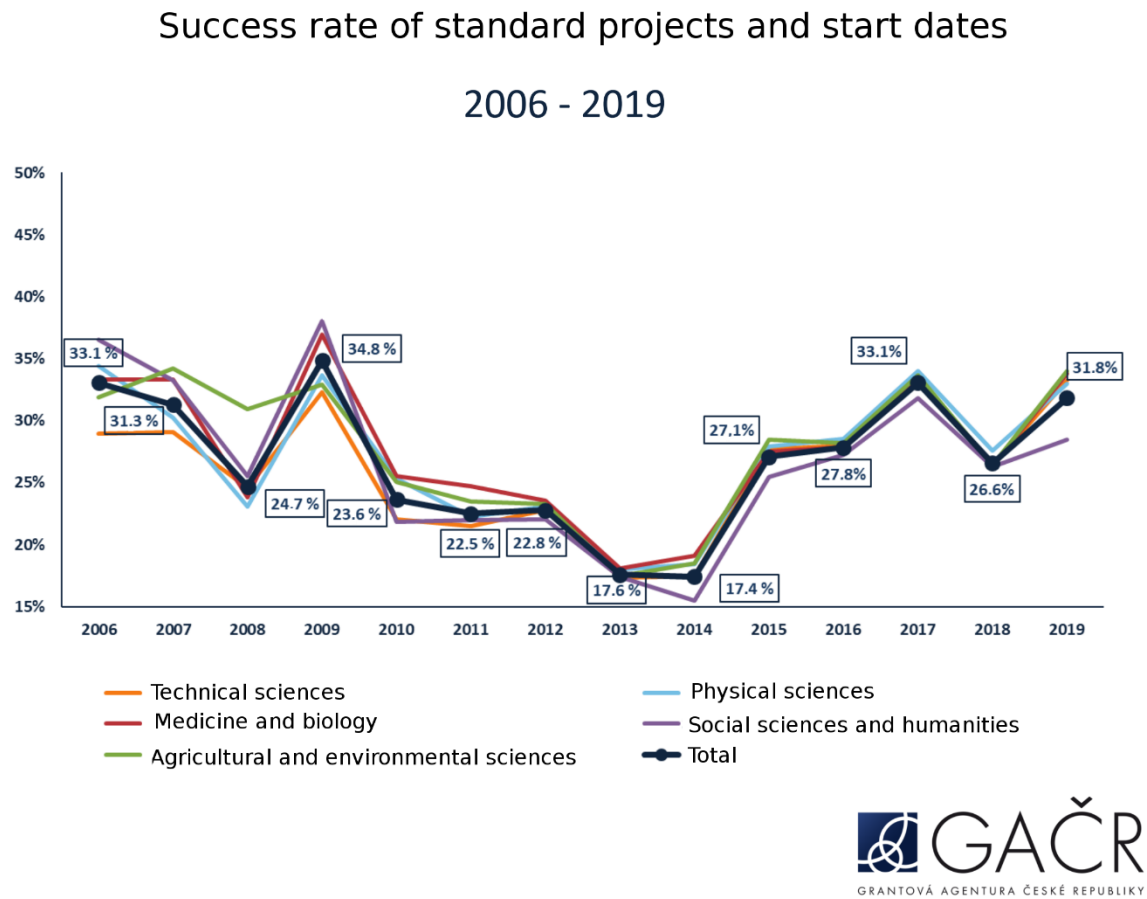
Czech Science Foundation supports scientific projects across all disciplines of basic research. The disciplines are assigned to 40 review panels. For EXPRO projects, there are 8 subject committees as set out in the Czech Science Foundation Statute. The structure of the review panels and committees is outlined in the section "About Czech Science Foundation – Advisory Bodies" (Subject Committees and Review Panels).

The proposer chooses the review panel or subject committee to discuss the project. Hence, in the public tender, the project proposal will be reviewed by the panel or committee chosen by the proposer. You can find more information at https://gacr.cz/zakladni-informace/

3.1.1 Standard grant projects (GA)

Standard grant projects are basic research projects. The CSF has supported such projects since its establishment in 1993.
According to information from the RD&I IS, support has been provided (until March 2021) for 15,706 projects.

- The typical project duration is 3 years
- Any field in basic research is eligible for support.
- The project topic is chosen by the proposer.
- Eligible applicant entities include all legal and natural persons, organisational units of the state or regional self-governments, or those organisational units of the Ministry of Defence and Ministry of the Interior which are engaged in research and experimental development.
- Calls are typically announced once a year, normally in March. Evaluations are completed in the autumn and the results are announced before the end of the calendar year.
- The investigator can be either one person or an entire research team, whose members may even come from various institutions
- The main criteria considered for awarding the grant are the proposed objectives, the method of investigation, the planned outcomes, the applicant entity's foreign cooperation and earlier collaboration with CSF, and commensurate funding requirements.



Source: https://gacr.cz/wp-content/uploads/2019/04/GRAFY-NA-WEB-2019.pdf

In 2021, a call for proposals under this programme will be announced
.

3.1.2 International (bilateral) projects (GC)

International open-grants are awarded for basic research projects carried out in bilateral cooperation between scientists or research teams. The projects are selected in collaboration with various foreign funding providers:

- Deutsche Forschungsgemeinschaft (DFG), Germany
- National Research Foundation of Korea (NRF), Korea
- Ministry of Science and Technology (MOST), Taiwan
- São Paulo Research Foundation (FAPESP)
- Russian Foundation for Basic Research (RFBR)

According to information from the RD&I IS, support has been provided (until March 2021) for 220 projects.

The CSF can only award a bilateral project grant if the foreign provider awards the funding as well, i.e. the proposal must be accepted by both national providers.

- The projects can focus on any field of basic research.
- The project topic is chosen by the proposer.
- The project duration is 2–3 years
- In the Czech Republic, these public tenders are typically announced once a year, normally in March. The evaluation is completed in autumn and the date on which the results are announced in the Czech Republic depends on the date of award in the partner country.
- Each national provider only funds the project activities on its territory.

In 2021, a call for proposals under this programme will be announced

3.1.3 Junior grants (GJ)

Junior grants offer opportunities for excellent young scientists to build their independent teams with advanced instruments. Their goal is to enliven the structure of basic research in the Czech Republic. The first public tender was announced in 2014 and the last one in 2019.
According to information from the RD&I IS, support has been provided (until March 2021) for 491 projects. The last call was announced in 2019.

3.1.4 JUNIOR STAR (GM)

JUNIOR STAR grants aim to support excellence in basic research and provide early-stage scientists with an opportunity to achieve independence and build a team, obtain modern instruments and develop independent agenda at the highest international level to enliven the structure of basic research in the Czech Republic. Scientists with original thinking will thus be able to realize their goals at an early stage of their career. The first public tender was announced in 2020.
According to information from the RD&I IS, support has been provided (until March 2021) for 30 projects.

Principles:

- The project period 5 years.
- These projects can focus on any field of basic research.
- The project topic is chosen by the proposer. Only one applicant entity may be listed in the proposal.
- The proposer, i.e. the head of the investigation team, must have had received PhD or an equivalent degree within 8 years preceding 30 September of the year the public tender was announced. Only those working in basic research are eligible.
- The proposer should have significant experience in international research, have authored publications in renowned international journals or demonstrate an equivalent achievement of excellence.
- The aid rate may be up to 100%. The highest amount of aid for a single project is CZK 25 million.

In 2021, a call for proposals under this programme will be announced

3.1.5 LA grants (GF)

International grants known as LA grants are provided by Czech Science Foundation. Evaluation of the proposals is based on the Lead Agency principle. The grants support international cooperation in basic research.
According to information from the RD&I IS, support has been provided (until March 2021) for 52 projects.

Principles:

- The project period should be no longer than three years.
- Projects should lead to justified collaboration between teams from the Czech Republic and Austria.
- All scientific and basic research disciplines are eligible.
- Scientific teams are funded by their national agencies.
- The budgets reflect the principles of bilateral cooperation (neither side is restricted in any way but the spend must be justified).
- Project proposals are submitted to only one agency (the “lead agency” principle).
- Public tenders of this type are announced once a year, usually in November.

LA grants started in 2015 and their support will end in 2022. In the final two years, no new projects will be launched, and those running will be finished as planned. The project duration in this scheme was set at 24–36 months as being the optimum period for achieving their objectives.

In 2019, the CEUS agreement was signed. This new partnership will enable researchers from the Czech Republic, Austria, Poland and Slovenia to conduct research projects in collaboration with new foreign partners. In the framework of CEUS, an initiative promoting basic research in Central Europe, researchers will now be able to propose bilateral and trilateral projects under the Lead Agency principle. The programme may be updated or a new programme may be launched to reflect these changes.

The aid intensity can be up to 100%. The maximum amount of aid for a single project is defined by the Framework (i.e. EUR 20 million) but tends to be more than three orders of magnitude lower for projects of this type.

3.1.6 Projects which support international collaboration for obtaining ERC grants (GH)

This is a separate type of projects which support applicants for ERC grants. The aim is to help scientists acquire experience and succeed in obtaining funding from the schemes of the European Union, and to promote excellence in basic research in the Czech Republic.

The CSF has been supporting these projects since 2016. The project duration is 3–6 months. These projects can focus on any field of basic research. The project topic is chosen by the proposer. Only one applicant entity may be listed in the proposal.

To be eligible to submit an open-grant project application under “Support of ERC Grant Applicants”, the responsible applicant employee shall be an investigator of a running Junior Grant project which has passed at least one evaluation, or an investigator of a completed Junior Grant project whose last evaluation rating prior to the submission of the “Support of ERC Grant Applicants” application was either “fulfilled” or “excellent”.

The call for proposals of projects which support international collaboration for obtaining ERC grants in basic research is announced upon consultation with the European Research Council (ERC). Funding for these open-grant projects is to be provided upon the call for proposals and until 2022.
The Support of ERC Grant Applicants project will be conducted in a foreign facility. The evaluation will take place at an international level. Key evaluation criteria include scientific excellence, innovation, originality, prior scientific and publication activity of the responsible applicant employee, and his or her

professional qualification for submitting a project application to one of the main ERC funding schemes (StG, CoG, AdG) with the host institution in the Czech Republic within the prescribed time limit upon completion of this open-grant project.

3.1.7 EXPRO grants for excellence in basic research (GX)

These new grants aim to support research teams led by prominent internationally-recognised scientists or by young researchers who demonstrate a clear potential for excellence. This funding should go towards areas of excellence, or those with a potential for excellence, and ultimately boost the quality of Czech science. Excellent research depends on top scientists and is often associated with high risk-high gain projects, such as ERC projects. No support for such projects has been available in the Czech Republic so far, leading to low success rates in obtaining ERC grants.
According to information from the RD&I IS, support has been provided (until March 2021) for 58 projects.

Applications will be evaluated with the emphasis on the proposer's excellence, publications and other criteria. The projects should take five years and their staff's FTE should be no less than 0.5. The grants are expected to reach up to CZK 10 million/year, i.e. much more than in standard projects. For an EXPRO project to be completed successfully, either the investigator or one of the team members must submit an application for an ERC grant within six years of the project start date.

In 2021, a call for proposals under this programme will be announced.

3.1.8 POSTDOC INDIVIDUAL FELLOWSHIP (GN)

The latest call, which is to be announced by CSF for the first time in 2021, is POSTDOC INDIVIDUAL FELLOWSHIP (PIF). These grants are intended for researchers who completed their doctoral degree in the last four years. They can be used as attachment grants which enable Czech researchers to conduct research at any research facility across the globe, provided that they stay one more year at an institution in the Czech Republic, or as an invitation grant, for a foreign researcher to perform research in a Czech institution for two years. This is reflected in the two sub-programmes: Incoming and Outgoing. They are intended for scientists who arrive in the Czech Republic and for those who apply for an attachment grant.

The first call for proposals under this programme will be announced in 2021.

3.1.9 Public tenders

Programme code	Tender end date
GA	22/04/2021
GC	
GM	
GX	
GN	
GH	To be announced after consultation with the European Research Council (ERC)

3.1.10 Contacts and additional information

Czech Science Foundation (Grantová agentura České republiky)
Evropská 2589 / 33b, 16000, Praha 6, Czech Republic
Phone: +420 227 088 841
e-mail: info@gacr.cz

Links:
www.gacr.cz
www.gacr.cz/zadavaci-dokumentace

3.2 Technology Agency of the Czech Republic (TA CR)

The Technology Agency of the Czech Republic is an organisational unit of the state, established in 2009 by Act No. 130/2002 Sb., which commenced its activities in 2010. TA CR provides state aid for applied research and development, which had previously been fragmented and administered by a large number of public funding providers.

The TA CR fulfils the following tasks:

- Designs and implements applied research, development and innovation programmes, including those designed to meet the needs of the state administration, conducts public tenders in research, and awards public contracts
- Evaluates and selects project proposals in thematic programmes
- Provides specific-purpose funding for programme projects through grant agreements and grant award decisions
- Monitors the performance of grant agreements and compliance with grant award decisions, and audits the use of specific-purpose funding
- Evaluates and audits programme projects, their objectives, and the results produced
- Fosters cooperation between research organisations and the private sector, and co-funds programme projects

In TA CR programmes, the amount of funding available for individual public tenders varies substantially between the initially approved programme version, the medium-term projection for the state budget and the actual public tender. There might be some variation in the conditions as well (e.g. in the aid intensity). The version relevant to applicant entities is always the tender dossier for the public tender.

Since 2019, Technology Agency of the Czech Republic runs R&D programmes for other ministries as well. As a result, they do no provide specific-purpose support but take part in developing relevant programmes and delivering R&D goals in their remit. They are the Ministry of the Environment, Ministry of Transport and Ministry of Industry and Trade.

Besides the following programmes, TA CR also administers international cooperation programmes listed in section 6.5.

3.2.1 National programmes of the Technology Agency of the Czech Republic

BETA2 (TI)

The full name of the programme is **BETA2 programme of public contracts in applied research and innovation for state administration - 2017–2024**. The programme aims to support the development of new or the improvement of existing procedures, regulatory mechanisms, supervisory activities, skills, services, information and control products and procedures for higher efficiency and effectiveness in the performance of state administration. The programme period was extended to 2024.

According to information from the RD&I IS, support has been provided (until March 2021) for 135 projects.

The programme mainly supports the construction and innovation of various models, and formulation of amendments to existing legislation and government policy strategies in both national and European contexts (e.g. economic or social policies). Its outputs should include new methods for evaluating the effectiveness of such policies and strategies, and background documents for shaping future policies, improving the performance of state administration, and for effective allocation of public resources. Extension of the programme until 2024 is being discussed.

The research and development themes under this programme are classified according to the needs of various state administration bodies. These needs should reflect the relevant priorities, e.g. those set

forth in strategic and conceptual documents. The goals of each project will be clearly defined in its tender dossier.

Since 2017, the Technology Agency of the Czech Republic (TA CR) has been administering projects that answer the needs of the following state administration bodies (referred to as “expert guarantors”):

- Ministry of Transport (including the Civil Aviation Authority)
- Ministry of Labour and Social Affairs
- Ministry of Regional Development
- Ministry of the Interior
- Ministry of Foreign Affairs
- Ministry of Industry and Trade
- Ministry of the Environment
- Czech Mining Authority
- Czech Statistical Office
- Czech Office for Surveying, Mapping and Cadastre
- Energy Regulatory Office
- Administration of State Material Reserves
- State Office for Nuclear Safety
- Office of the Government of the Czech Republic
- Other central state administration bodies and other providers of specific-purpose funding pursuant to section 4 of the Support of Research and Development Act.

The programme is planned for 8 years from 2017 to 2024. The research needs of relevant state administration bodies will be identified and collected throughout each calendar year between 2016 and 2023 and the aid will be awarded for the next year. The minimum and maximum project periods will be determined with respect to the research theme, the specific nature of applied research and the different needs addressed. The project period will not extend beyond the period of the entire programme.

ZETA (TJ)

The full name of the programme is **ZETA Programme of applied research 2017 – 2025.** The goals of the programme are to involve students and young researchers in research and development aimed at real-world applications, stimulate their interest in projects with concrete and practical outcomes, and promote such projects in academia while strengthening their links to business.

According to information from the RD&I IS, support has been provided (until March 2021) for 300 projects.

Its sub-objective is to promote equal opportunities for young female and male researchers in applied research projects.

The first public tender was announced in 2017 and funding will be released in 2018. Further public tenders were announced on an annual basis until 2020. Their respective funding begins between 2018 and 2021. In 2021, no call will be announced. The programme will be replaced with the Sigma programme.

ETA (TL)

The full name of the programme is **ETA programme for applied research, experimental development and innovation in social sciences and humanities 2018** – **2023.** The programme strengthens the role of the social sciences and humanities in applied research projects, experimental development and innovation for the benefit of the quality of human life and in response to dynamic social, economic, globalisation-related, cultural and technological transformations.
According to information from the RD&I IS, support has been provided (until March 2021) for 363 projects.

The programme supports projects that focus on one or more of the following aspects:

- benefits of the multidisciplinary approach,
- integration of technical and non-technical research,
- realization of the application potential of basic research.

The aim of the programme is to strengthen the role of social sciences and humanities in applied research, experimental development and innovation in order to obtain new or substantially improved products, procedures, processes or services in the following areas:

- people and society in the context of the dynamic societal and technological transformations and challenges in the 21st century;
- people and environment for their life in the context of sustainable development of the land, regions, cities, municipalities and building culture;
- people and the economy in the context of the emergence of new competitive advantages and development of competences for the 21st century;
- people and the social system in the context of interaction between citizens and the state, public policies, administration and citizen-oriented public services.

The first public tender was announced in 2017 and funding was released in 2018. Further public tenders were announced on an annual basis throughout the 2018–2021 period. Their funding begins between 2019 and 2021. In 2021, no call will be announced. The programme will be replaced with the Sigma programme.

THETA (TK)

The full name of the programme is **The new THETA programme of applied research, experimental development and innovation in the power industry 2018 – 2025.** The programme focus reflects the updated State Energy Policy of the Czech Republic which was adopted by the Government of the Czech Republic in May 2015. The Policy sets forth the need for supporting research and development projects for the power industry in response to adopted strategy documents, the European Strategic Energy Technology Plan and in the context of the priority area Sustainable Power Industry.
According to information from the RD&I IS, support has been provided (until March 2021) for 159 projects.

Through the outcomes and impacts of its projects, the programme aims to help fulfil the vision of transformation and modernisation of the power sector in the medium and long-term in accordance with the adopted strategy documents. To accomplish this, the support for research, development and innovation in the power industry will focus on:

- projects in the public interest;
- new technologies and system components with high potential for rapid adoption;
- long-term technology visions.

Amount of funding from the state budget planned for the entire programme period (according to current conditions of the programme)

Period	2018	2019	2020	2021	2022	2023	2024	2025	Total
Amount of aid (CZK)	200,000 thous.	360,000 thous.	580,000 thous.	640,000 thous.	640,000 thous.	640,000 thous.	600,000 thous.	340,000 thous.	4,000,000 thous.

Project period
The maximum project period under this programme is 8 years. On average, the expected project duration is 36 months. The project period must not extend beyond the period of the entire programme.

Form and amount of funding
The expected average aid intensity over the programme period is 70%. In sub-programmes 1 and 3, the maximum allowed aid intensity in a single project is 100% of the approved costs. In sub-programme 2, it is 80%. The aid intensity defined as a percentage of approved project costs shall be calculated separately for each project, each beneficiary and each additional participant. Where funding is granted to enterprises pursuant to the GBER, the maximum aid intensities defined therein shall apply.

	Small enterprise	Medium-sized enterprise	Large enterprise	RO
Industrial research	70%	60%	50%	100%
Industrial research under conditions of effective collaboration	80%	75%	65%	100%
Experimental development	45%	35%	25%	100%
Experimental development under conditions of effective collaboration	60%	50%	40%	100%
Innovation for small and medium-sized enterprises	50%	50%	0%	0%
Innovation in procedures and organisation	50%	50%	15%	100%

Aid beneficiaries
Under the Support of Research and Development Act, the Framework and the GBER, the applicant entities and project aid beneficiaries in all sub-programmes may include the following:

- **Undertakings** – legal entities, regardless of their legal form, and natural persons which (according to Annex 1 to the GBER) conduct economic activities, carry out the project alone or in cooperation with other participants, and prove their ability to co-fund the project from non-public resources.

- **Research and knowledge dissemination organisations** ("research organisations") – legal entities which meet the definition of a research organisation according to Article 2, section 83 of the GBER and the Support of Research and Development Act and which carry out the project alone or in cooperation with other participants.

Other eligible applicant entities relevant only to sub-programmes 1 and 3: Other natural persons and legal entities governed by public or private law, regardless of their legal form or method of funding which conduct activities eligible for funding outside public support schemes, i.e. entities other than undertakings. Under this programme, funding shall only be granted to those applicant entities which fulfil the qualification criteria set out in section 18 of Act No. 130/2002 Sb. If a project proposal is submitted by multiple applicant entities, each of them shall be required to prove their qualification. The applicant entity shall prove their qualification pursuant to the Support of Research and Development Act and as defined by the funding provider in the tender dossier.

The first public tender was announced in 2017 and funding will be released in 2018. Further public tenders are announced on an annual basis between 2018 and 2023. In 2021, a call is announced.

National Centres of Competence 1 (TN)

The programme promotes long-term cooperation between the research base and industry, and aims to strengthen institutions involved in applied research. To guarantee long-term stability, it will be followed by the National Centres of Competence 2 programme in 2020–2026. It also aims to establish synergistic links between successful centres built with support from the TA CR (the Centres of Competence), the CSF (the Centres of Excellence), and operational programmes (predominantly the RDI Centres) and other research centres and units, to build an integrated system. It will help to

strengthen applied research organisations and motivate the relevant research facilities to transform into research and technology centres which can conduct high-quality applied research to meet the needs of industry. One of its purposes is to deliver synergistic and complementary effects in international schemes, such as H2020 and other EU programmes, and in international programmes with compatible orientations.
According to information from the RD&I IS, support has been provided (until March 2021) for 13 projects.

This programme aims to increase the efficiency and quality of the results of applied research and technology transfer in key areas with a growth potential, to increase the competitiveness of undertakings, and to strengthen the excellence and industrial relevance of research organisations. To achieve this, a stable and robust applied research base must be built (national centres of competence) by concentrating research capacities and focusing on industrial application of their research.

The programme was planned for the five-year period from 2018 to 2022, but its extension until 2026 was approved in 2019

Amount of funding from the state budget planned for the entire programme period (according to current conditions of the programme)

Period	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Amount of aid (CZK)	100,000 thous.	230,000 thous.	700,000 thous.	894,000 thous.	972,000 thous.	1,072,000 thous.	1,072,000 thous.	1,072,000 thous.	1,072,000 thous.	7,184,000 thous.

Project period
The maximum project period under this programme is 5 or years. The first public tender focused on projects planned for a period ending in 2020, with possible extension by two years, i.e. until 2022. The second public tender is planned for early 2020. Funding is to be released in 2021 for projects of up to six years. The project period must not extend beyond the period of the entire programme.

Form and amount of funding
The expected average aid intensity over the programme period is 80 %. The maximum available aid intensity is 90%. The aid intensity defined as a percentage of approved project costs will be calculated separately for each project, each recipient, and each additional participant. Securing a significant portion of funding from other sources (non-public sources, EU programmes and others) is expected to be a mandatory condition for providing the aid. This condition will be specified in the tender dossier.

Aid beneficiaries
Under the Support of Research and Development Act, the Framework and the GBER, the applicant entities for project aid, and beneficiaries, may include the following:

- **Research and knowledge dissemination organisations** (“research organisations”) – legal entities which meet the definition of , a research organisation according to Article 2, section 83 of the GBER and the Support of Research and Development Act and which carry out the project in cooperation with other participants. Where the research organisation conducts not only non-economic activity but also economic activities, its shall account for the costs and revenues from these economic activities separately.
- **Other legal entities** governed by public or private law, regardless of their legal form or method of funding which conduct other than economic activities, i.e. entities other than undertakings.
- **Undertakings** legal entities, regardless of their legal form, and natural persons which (according to Annex 1 to the GBER) conduct economic activities, carry out the project in cooperation with other participants, and prove their ability to co-fund the project from non-public resources.

A public tender was announced in 2018 and its funding was released in the same year. Based on the evaluation of the first public tender, subsequent public tenders should be announced. The first public tender focused on projects planned for a period ending in 2020, with possible extension by two years, i.e. until 2022. The other planned public tender was postponed due to lack of funding in 2020.

GAMA 2 (TP)

The full name of the programme is **GAMA 2 Programme of applied research, experimental development and innovation 2020 -2022.** This programme's objective is to support new systems and streamline the existing systems for transfer of R&D results – those produced by research organisations (ROs) alone or in collaboration with industry – into real-world applications with a view to their commercialisation. The medium-term objectives of the programme aim to stimulate creation of new results of R&D (including those in social sciences and humanities) which lead to actual innovation in enterprises (primarily small and medium-sized ones) using the R&D results generated by publicly-funded ROs. In the long term, these objectives will contribute to efficient use of public funding of R&D and help improve the economic performance of ROs, the competitiveness of the country's economy and society and to higher quality of life.

It should support R&D for innovation of existing products, services and technologies in businesses to facilitate their exploitation in additional areas (market expansion strategy) and for development of new products, services and technologies (market creation strategy).
According to information from the RD&I IS, support has been provided (until March 2021) for 27 projects.

Sub-programme 1 supports application of results of R&D developed by ROs which show high potential for use in new and improved high-added-value products, manufacturing processes or services and promise improved competitiveness.

Sub-programme 2 supports synergetic projects under EU's Horizon 2020 and its successor, Horizon Europe. These include projects with receive the Seal of Excellence under Horizon 2020 and Horizon Europe. These projects lead to commercialization of results of research. They help bridge the commercialization valley of death between research and the launch of a product. They show strong market potential and offer innovative solutions.

Amount of funding planned for the entire programme period

Period	2020	2021	2022	Total
Amount of aid (CZK)	180,000 thousand	185,000 thousand	185,000 thousand	550,000 thousand

Project period
The programme is planned for 3 years from 2020 to 2022.
The first public tender for projects under sub-programme 1 was announced in 2019 and funding will be released in 2020. Further public tenders are expected to be announced on an annual basis between 2020 and 2 for sub-programme 2 only. The project period must not extend beyond the period of the entire programme.

Form and amount of funding
Under sub-programme 1, the highest allowed aid intensity is 100%. Under sub-programme 2, it is 70%, provided that the block exemption is invoked under GBER. The aid intensity defined as a percentage of approved project costs will be calculated separately for each project, each recipient, and each additional participant according to the GBER, and the Framework and shall follow all the limits below.

Aid beneficiaries
Under sub-programme 1, the beneficiaries shall meet all conditions for ROs under law and the Framework. A research organisation may become another project participant, provided that its contribution is specified in the project proposal and that it enters into a project contract with the beneficiary.

In sub-programme 2, the beneficiaries include those entitled to apply for support under the relevant tool of EU programme Horizon 2020 or Horizon Europe.
A call in sub-programme 2 is planned for June 2021.

3.2.2 Sectoral programmes of the Technology Agency of the Czech Republic

Environment for Life – Sectoral programme of the Ministry of the Environment (SS)

The full title of the programme is **Programme of applied research, experimental development and innovation in the field of the environment – Environment for Life 2020-2026**.
The goal of this programme is to provide new solutions related to the environment, to secure and expand a knowledge base which can contribute to creating a healthy and good-quality environment in the Czech Republic and to sustainable use of its resources, minimize adverse impacts of human activity on the environment, including cross-border impacts, and therefore improve the quality of life in Europe and across the globe. The solutions will help mitigate the impact of the climate change on both nature and human society, namely reduce the impact of and prevent drought, alleviate the effects of other extreme weather phenomena (wind, floods, extreme temperatures), improve the quality of the air and water, expansion of waste management, circular economy and effective use of raw materials, protection of natural resources, water, soil and rocks, preservation of biodiversity and improved protection of environment and landscape and development of environmentally-friendly society which is secure and resilient to the climate change.
According to information from the RD&I IS, support has been provided (until March 2021) for 51 projects.

The specific objectives of the programme are as follows:

1. Contribute to adaptation to the climate change and to introduction of economically effective mitigation measures
2. Help improve the quality of the environment and support the introduction of circular economy.
3. Support resilient ans secure society and environment

Amount of funding planned for the entire programme period

Period	2020	2021	2022	2023	2024	2025	2026	Total
Amount of aid (CZK)	222,000 thous.	422,000 thous.	557,000 thous.	647,000 thous.	707,000 thous.	710,000 thous.	535,000 thous.	3,800,000 thous.

Project period
The programme is planned for 7 years from 2020 to 2026.
The first public tender was announced in 2019 and funding will be released in 2020. Further public tenders are expected to be announced on an annual basis between 2020 and 2024.
The maximum project period under this programme is 7 years (however, it may differ in sub-programmes). On average, the projects can be expected to run for 30 months. The project period must not extend beyond the period of the entire programme

Form and amount of funding
The average aid intensity over the programme period is 85 %. Under sub-programmes 1 and 3, the highest allowed aid intensity for a project is 100%. Under sub-programme 2, it is 90%, provided that the research organisation conducts it alone. The aid intensity defined as a percentage of approved project costs will be calculated separately for each project, each recipient, and each additional participant according to the limits stipulated in GBER, and the Framework. Participation of

undertakings is provided for in Article 25, sections 5 and 6 of GBER. The maximum aid intensity for research organisations is 100%.

Aid beneficiaries
The beneficiaries under the Act, the Framework and GBER may include the following:

- **Undertakings -** any entities which meet the conditions set out in Article 2, sections 2 and 24 of the GBER, i.e. legal entities, regardless of their legal form, and natural persons which conduct economic activities and carry out the project alone or in cooperation with other participants, and prove their ability to co-fund the project from non-public resources
- **Research and knowledge dissemination organisations (research organisations, RO)**, legal entities which meet the definition in Article 2, section 83 of the GBER and the Act and which carry out the project alone or in cooperation with other participants.
- Under sub-programmes 1 and 3, eligible main participants (under sub-programme 2 other participants) include: **Other natural persons and legal entities** governed by public or private law, regardless of their legal form or method of funding which conduct project activities eligible for funding outside public support schemes, i.e. entities other than undertakings

A call is planned for June 2021.

TRANSPORT 2020+, a sectoral programme of the Ministry of Transport (CK)

The full name of the programme is **Programme for support for applied research, experimental development and innovation in transport - TRANSPORT 2020+.** The main objective of the programme is to ensure, through the outcomes, results and impact of the projects, that the transport sector develops in a manner which reflects the societal needs, boosts the technological and knowledge-based growth and competitiveness of the country. The requirements for transport, such as sustainability, safety and interoperability, will be reflected in specific objectives of the programme and met by completing the research, development and innovation projects. The programme will also aim to fulfil public interests by defining relevant methodological, legislative and standard frameworks.
According to information from the RD&I IS, support has been provided (until March 2021) for 47 projects.

The specific objectives of the programme are as follows:

1. Sustainable transport
2. Safe and resilient transport and transport infrastructure
3. Accessible and interoperable transport
4. Automation, digitisation and navigation and satellite systems

Amount of funding planned for the entire programme period

Period	2020	2021	2022	2023	2024	2025	2026	Total
Amount of aid (CZK)	150,000 thous.	250,000 thous.	350,000 thous.	450,000 throus.	350,000 thous.	250,000 thous.	150,000 thous.	1,950,000 thous.

Project period
The programme is planned for the period from 1 January 2020 to 31 December 2026 (7 years). Under the programme, the first public tender was announced in 2019 and the funding is to be released in 2020. Further public tenders are expected to be announced in 2020, 2021 and 2022. Overall, four public tenders will be announced with their funding released in the years 2020, 2021, 2022, 2022 and 2023. The expected project period under this programme is 36 months and the maximum period is 48 months. The project period must not extend beyond the period of the entire programme.

Form and amount of funding
The expected average aid intensity over the programme period is 80%. The aid intensity defined as a percentage of approved project costs shall be calculated separately for each project, each beneficiary and each additional participant. Where funding is granted to enterprises pursuant to the GBER, the maximum aid intensities defined therein shall apply. The highest permitted aid intensities for individual aid categories and categories of beneficiaries and other participants will be stipulated in the tender dossier for each public tender. The highest allowed aid intensity for a project is 100% (for research organisations). The actual aid rate for individual projects will be determined according to limits defined by the GBER. In accordance with the GBER, a bonus may be awarded beyond the general aid intensity to participants who have met the conditions for effective collaboration under Article 25, section 6b), letter i). Collaboration is understood not to include contract research and provision of research services.

Aid beneficiaries
Under the Act and the GBER, applicants and beneficiaries may include:

- **Undertakings** – legal entities and natural persons which, according to Annex 1 to the GBER, conduct economic activities, carry out the project alone or in cooperation with other participants, and prove their ability to co-fund the project from non-public resources,
- **Research and knowledge dissemination organisations (RO)** – legal entities which meet the definition of a research organisation according to Article 2 83 of the GBER and the Act and which carry out the project alone or in cooperation with other participants,
- **Other natural persons and legal entities** governed by public or private law, regardless of their legal form or method of funding which conduct other than economic activities, i.e. do not offer goods/services on the market (i.e. entities other than undertakings).

A call is planned for June 2021.

TREND - a sectoral programme of the Ministry of Industry (FW)

The full name of the programme is **Programme of applied research and experimental development TREND 2020-2027.**.
The programme aims to strengthen the competitiveness of undertakings in the international context, primarily by expanding their foreign markets, entering new markets and shifting higher in global value chains. This objective will be fulfilled by providing aid for industrial research and experimental development projects and by the transfer of their results to practice, namely industrial production and products on the market. In line with the focus described below, the aid will be directed predominantly towards projects which develop new processes and materials, expand automation and robotization and the use of digital technologies. Sub-objectives which will contribute to meeting the main objective will include an increase in the number of undertakings which conduct their own research and development and their involvement in collaborative research, and strengthening the orientation of research organisations in the Czech Republic on internationally-competitive applied research to deliver benefits for industry and the society.
According to information from the RD&I IS, support has been provided (until March 2021) for 186 projects.

<u>Sub-programme 1 “Technology leaders”</u>
Sub-programme 1 supports R&D and the use of its results for business activities (namely for improving the efficiency of production and introduction of new products or services) of those undertakings which have experience with their own research and development (by stabilising and developing their research departments) and those which used to procure R&D services from research organisations instead of performing their own R&D.
<u>Sub-programme 2 “Novices”</u>
The sub-programme’s objective is to help launch research and development activities in those undertakings which until now have neither conducted their own R&D on a regular basis nor purchased R&D services from research organisations.

Amount of funding planned for the entire programme period

Period	2020	2021	2022	2023	2024	2025	2026	2027	Total
Amount of aid (CZK)	515,000 thous.	1,095,000 thous.	1,605,000 thous.	1,900,000 thous.	1,950,000 thous.	1,435,000 thous.	855,000 thous.	345,000 thous.	9,700,000 thous.

Project period

The programme is planned for the period from 1 January 2020 to 31 December 2027. The first public tender was announced in 2019 and its funding is to be released in 2020. Further public tenders are to be announced on an annual basis throughout the 2020–2023 period. Their funding will begin between 2021 and 2024.

Project duration is expected to be no more than 60 months. The project period must not extend beyond the period of the entire programme.

Form and amount of funding

The aid intensity defined as a percentage of approved project costs will be calculated separately for each project, each recipient, and each additional participant according to the GBER, and the Framework. For a single project, it may reach no more than:

- 70% of total approved costs per project in sub-programme 1,
- 80% of total approved costs per project in sub-programme 2.
- Research organisations may receive up to 90% aid but only for their non-economic activities pursuant to Article 2.1.1, section 19 of the Framework, and provided that all related provisions of the GBER and the Framework are met, and the maximum allowed aid intensity for a single project under the programme does not exceed the limit for the sub-programme.

The public funding provider may stipulate a lower maximum aid intensity in the conditions of each public tender. In accordance with the GBER, a bonus may be awarded beyond the general aid intensity to participants who have met the conditions for effective collaboration. Within the definition of the Framework (point 27 et seq.) and the GBER (Article 2, section 90) effective collaboration means collaboration of no fewer than two independent parties to exchange knowledge or technology, or to achieve a common objective based on the division of labour where the parties jointly define the scope of the collaborative project and share its risks and outputs. Collaboration is understood not to include contract research and provision of research services.

Aid beneficiaries

<u>Sub-programme 1 “Technology leaders”</u>

Under the Act, the applicants for aid may include undertakings, legal entities and natural persons which pursue economic activities according to Annex 1 to GBER. Other project participants may include:

- undertakings (see the above definition),
- research organisations – organisational units of the state, organisational units of ministries engaged in research and legal persons which meet the definition of a research and knowledge dissemination organisation according to GBER and the Framework.

Beneficiaries may include undertakings which conduct the project alone or in collaboration with other undertakings and/or research organisations (in the form of collaborative research pursuant to the Framework). The applicant for specific-purpose support will be required to submit two years-worth documents of economic (accounting) history. Specific qualification conditions will be set out in the public tender dossier by the public funding provider in accordance with the Act.

<u>Sub-programme 1 “Novices”</u>

Aid beneficiaries may include undertakings which conduct the project in collaboration with an RO (as collaborative research and not as contract research). The applicant will be required to demonstrate that the aggregate worth of any aid they may have received from the state budget or other public

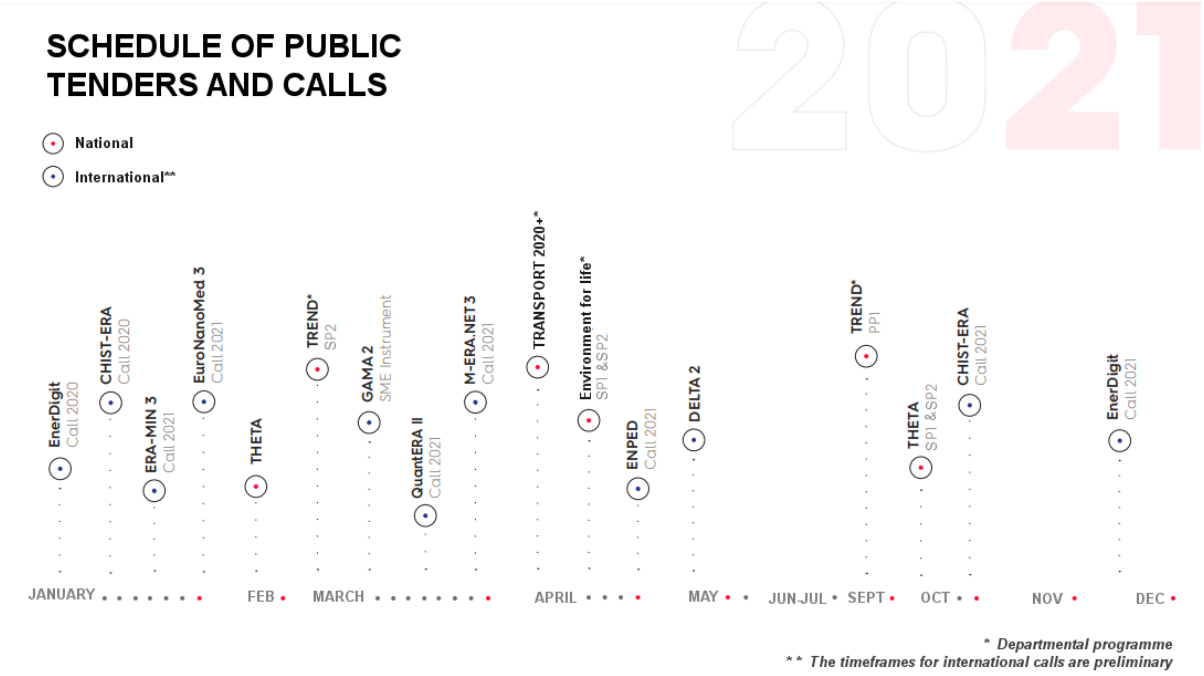
budgets for their own or procured research and development activities over the last five years did not exceed CZK 1 billion. Other project participants may include:

- undertakings,
- research organisations - see above.

Specific qualification conditions will be set out in the public tender dossier by the public funding provider in accordance with the Act.

A call is planned for June 2021.

3.2.3 Public tenders



The schedule of calls for tenders is shown in the following graph. Those marked in red are public tenders under programmes in this section, whereas the blue ones are the international ones outlined in section 6.5.

The schedule of public tenders conducted Technology Agency of the Czech Republic in 2021 is posted at https://www.tacr.cz/programy-a-souteze/

3.2.4 Contacts and additional information

Technology Agency of the Czech Republic
TA CR Office
Evropská 1692/37
160 00 Praha 6, Czech Republic
Phone: +420 234 611 111
e-mail: info@tacr.cz

Links:
www.tacr.cz

3.3 The Ministry of Culture (MC)

The Ministry of Culture administers the Programme for Applied Research and Development of National and Cultural Identity 2016 – 2022 (NAKI II) (DG code) under which no more public tenders will be announced. NAKI III programme is under preparation.

3.3.1 The NAKI II Programme for Applied Research and Development of National and Cultural Identity 2016–2022 (DG)

The main objective of the programme is to support research and development activities in the field of national and cultural identity to deliver economic or other societal benefits.
According to information from the RD&I IS, support has been provided from NAKI II (until March 2021) for 155 projects.

3.3.2 Contacts and additional information

Ministry of Culture
Maltézské náměstí 1, 118 11 Praha 1, Czech Republic
Department of Research and Development
Office in Prague 7: Dukelských hrdinů 47
Phone: +420 224 301 431
e-mail: martina.dvorakova@mkcr.cz

Links:
www.mkcr.cz
www.mkcr.cz/vyzkum-a-vyvoj-18.html

3.4 Ministry of Defence (MD)

The Ministry of Defence administers a programme of applied research and experimental development: Development of Armed Forces of the Czech Republic (2015–2022, code: OW) which is near completion. Another programme, “Ambition” for 2020 to 2026 is running.

3.4.1 Development of Armed Forces of the Czech Republic (OW)

The main goal of this programme is to develop the abilities of the Armed Forces of the Czech Republic in areas which are essential for the defence of the country, for achieving the country’s declared political-military ambitions, and for the Armed Forces’ successful performance in all other roles. **According to information from the RD&I IS, support has been provided (until March 2021) for 76 projects**.

3.4.2 Ambition (OY)

Full name of the programme: **Ambition – fostering development in areas where armed forces achieve significant results in NATO and the EU, 2020- -2026.** The Ministry of Defence will support applied research which will translate into development and innovation efforts leading to implementation of the results in practice to enhance the capabilities of armed forces and relevant relations to the security system of the country.
According to information from the RD&I IS, support has been provided (until March 2021) for 2 projects.
.
Given the changing nature of the security environment, the objectives can be assumed to be expanded or reduced in certain aspects over the course of the programme. Under the programme, defence RDI projects will be carried out to meet precisely defined needs and requirements of the Ministry of Defence in the following areas:

- Development of national defence policy, command and control support in the changing security and operational environment, and the role of the armed forces in society
- Development of new weapon and defence systems
- Effective protection of the forces and material
- Training of personnel
- Preparation, sustainability and effective operation of the forces
- Medical support
- Development of command and control systems, communication and information systems and cyber defence

Amount of funding planned for the entire programme period (according to current conditions of the programme)

Year	2020	2021	2022	2023	2024	2025	2026	Total
Amount of aid (CZK)	20,000 thous.	140,000 thous.	230,240 thous.	340,000 thous.	325,000 thous.	185,000 thous.	95,000 thous.	1,335,240 thous.

Project period
The programme is planned for 7 years from 2020 to 2026.
Projects under this programme with a minimum project period of 1 year and a maximum of 4 years are to be completed by 31 December 2026 at the latest. Under the programme, the first projects will be awarded in 2020.

Form and amount of funding
Public aid will also be provided for basic research but mainly for applied research, experimental development and innovation in new or substantially enhanced products, technologies or services down to their validation in military field tests, introduction and practical use.

Aid beneficiaries
The aid beneficiaries and other project participants can be any entity that meets the requirements set out in Act No. 130/2002 Sb. Under this programme, funding for a project shall only be granted to those applicants which fulfil the qualification criteria set out in section 37 of Act No. 134/2016 Sb. If a project proposal is submitted by multiple applicants, each of them shall be required to prove their qualification. The method of proving qualification is defined by the public funding provider in the tender dossier.

3.4.3 Public tenders

The Ambition programme is planned to being administer support in 2021.

3.4.4 Contacts and additional information

Ministry of Defence of the Czech Republic
Tychonova 1
160 01 Praha 6, Czech Republic
Phone: + 420 973 201 111
e-mail: posta@army.cz

Links:
www.vyzkum.army.cz
www.army.cz

3.5 Ministry of Industry and Trade of the Czech Republic (MIT)

At the Ministry of Industry and Trade, the TRIO programme is running which is planned for the period from 2016 to 2022. An updated framework of the TRIO programme was approved by Government Resolution No. 280 on 30 April 2018. The changes included extension of the programme (i.e. funding of selected research and development projects) by one year, i.e. until and including 2022, and an increase of its budget to provide for the fourth public tender, which took place in autumn 2018. The follow-on TREND programme is a sectoral programme of the MIT administered by the Technology Agency of the Czech Republic. Today, the only running programme of the Ministry of Industry and Trade is Country for Future.

3.5.1 TRIO (FV)

The full name of the programme is **Programme of applied research and experimental development "TRIO "2016-2022.**. The programme's mission is to support applied research and experimental development of Key Enabling Technologies (KETs). These are knowledge-intensive technologies, which are associated with high research intensity, rapid innovation cycles, and require highly-skilled personnel. KETs can find use in new products and services with added value, and can contribute to economic growth and enhanced competitiveness of the Czech Republic and the European Union.
According to information from the RD&I IS, support has been provided (until March 2021) for 495 projects.

The running projects under this programme are coming to an end and no further applications for aid will be accepted.

3.5.2 The Country for the Future (FX)

One of the first financial measures brought by the new Innovation Strategy of the Czech Republic 2019 – 2030 was a programme for supporting innovation: **The Country For The Future 2020 - 2027**. It targets the national start-up and spin-off environment, digitisation and smart investment. Within this framework, it promotes robotization, automation and innovation in companies, mainly small and medium-sized enterprises, in line with the Industry 4.0 standards and key trends in promising industries.
According to information from the RD&I IS, support has been provided (until March 2021) for 42 projects.

The programme covers three themes:

- formation of innovative companies (high-tech start-ups), their development and internationalization;
- fostering innovation infrastructure with emphasis on digital services and artificial intelligence;
- implementation of innovation in practice (predominantly by exploiting existing results of R&D).

<u>Sub-programme 1 "Start-ups"</u>
The purpose of the sub-programme is to set up a comprehensive support framework for establishing, developing and funding high-potential start-ups oriented on innovative products and services. The goal is to increase the number of newly-formed innovation-oriented companies and boost their growth and to support companies with global innovation potential and accelerate their internationalization.

<u>Sub-programme 2 "Digital leaders"</u>
The sub-programme aims to foster creation of Digital Innovation Hubs (DIH) and expansion of their services in response to the needs formulated in the Digital Czech Republic strategy. The sub-programme will foster synergetic and complementary activities related to the Digital Europe programme which is under preparation. Sub-projects will relate to co-funding of projects under Digital Europe (co-funding from national sources is planned as part of this programme). These projects with relevance on European scale will be complemented with other projects focusing on completion of the national DIH network offering full service for innovative SMEs.

Sub-programme 3 “Innovation for industrial practice”
The sub-programme aims to boost innovation implementation in companies, predominantly SMEs, in line with Industry 4.0 standards and key trends in promising sectors. It will help companies adopt innovation, such as by exploiting results of RDI programmes, particularly in technologies and innovation related to automation, robotization and artificial intelligence, through investment. The projects will cover the preparation for adopting innovation in companies and acquisition of know-how, relevant technology and certificates for new products prior to launching production or new service. It will boost the collaboration between academia and the business sector in technology and knowledge transfer, and help convert the expertise of research organisations to marketable skills.

Amount of funding planned for the entire programme period (according to current conditions of the programme)

Period	2020	2021	2022	2023	2024	2025	2026	2027	Total
Amount of aid (CZK)	650,000 thous.	900,000 thous.	1,150,000 thous.	1,050,000 thous.	850,000 thous.	600,000 thous.	450,000 thous.	450,000 thous.	6,100,000 thous.

Project period
The programme is planned for the period from 1 January 2020 to 31 December 2027. The first public tender was announced in 2020. Several public tenders are planned each calendar year, depending on the requirements arising in sub-programmes.

Form and amount of funding
The aid intensity defined as a percentage of approved project costs will be calculated separately for each project, each recipient, and each additional participant according to the GBER, and the Framework or under de minimis rules. For a single project, it may reach no more than:

- 100 % of total approved costs per project in sub-programme 1,
- 100 % of total approved costs per project in sub-programme 2,
- 50 % of total approved costs per project in sub-programme 3.

The public funding provider may set lower maximum aid rates in individual public tender conditions for projects than above.

Aid beneficiaries
Sub-programme 1: Applicants may include organisational units of the state or units of ministries which are engaged in research and development, as well as legal persons as end recipients. Specific qualification conditions will be set out in the public tender dossier by the public funding provider in accordance with the Act.
Sub-programme 2: Under the Act, the applicants for aid for projects may include organisational units of the state or those of ministries which are engaged in research and development.
Sub-programme 3: Under the Act, the applicants for aid may include undertakings, i.e. legal entities which pursue economic activities according to Annex 1 to GBER and qualify as small and medium-sized enterprises.

3.5.3 Public tenders

Under Trio programme, no public tenders are planned. The TREND programme is administered by TACR – see section 3.2.2. Under TCFF programme, several public tenders are planned for each year, subject to the requirements of individual sub-programmes. They will be announced at https://www.mpo.cz/cz/podnikani/podpora-vyzkumu-a-vyvoje/

3.5.4 Contacts and additional information

Ministry of Industry and Trade of the Czech Republic
Na Františku 32, 110 15 Praha 1, Czech Republic

Department of Research, Development and Offset Programmes
Phone: +420 224 85 26 21
e-mail: korinkova@mpo.cz

Links:
www.mpo.cz
www.mpo.cz/cz/podnikani/podpora-vyzkumu-a-vyvoje

3.6 Ministry of the Interior (MI)

The Ministry of the Interior provides aid under four programmes. The projects under VI and VH programmes are coming to an end. No new calls for proposals will be announced. The follow-on programme IMPACT continues to announce calls. In addition, there is a new programme: SECTECH.

3.6.1 Programme for Security Research of the Czech Republic 2015–2022 (VI)

The year 2018 brought extension of the Programme of Security Research of the Czech Republic 2015–2020 until 2022 and an increase in its budget. The change was made in response to findings from the National Security Audit. The Audit identified new security threats and current needs of the security system. The change provided for an increase in the number of projects and results funded and for their faster completion and implementation in the security practice.

The main objective of the programme is to deliver better national security through new technologies, knowledge, and other outcomes of applied research, experimental development and innovation in the identification of, the prevention of, and protection against unlawful behaviour, and natural and industrial catastrophes that may harm the citizens, organisations, property, and infrastructures of the Czech Republic. The complexity of threats and risks, and the need for relevant changes to the security system of the Czech Republic continue to increase. Concatenation of potential security threats to the country and multiplication of their consequences are conceivable occurrences.
According to information from the RD&I IS, support has been provided (until March 2021) for 198 projects.

3.6.2 Programme for Security Research for National Needs 2016 - 2021 (VH)

The main objective of the programme is to deliver better national security by supporting research that meets the needs of state administration and enables those responsible for national security to acquire, master, maintain and develop specific abilities for performing effectively.
According to information from the RD&I IS, support has been provided (until March 2021) for 54 projects.

3.6.3 Strategic support for the advancement of security research in the Czech Republic 2019 - 2025 IMPACT 1 (VJ)

The programme aims to reach such level of knowledge, technology and engineering in the Czech Republic which would enable the country to acquire, master, maintain and develop specific abilities needed for national security and the safety of its citizens. The programme creates conditions for developing and exploiting the potential of academia and the public research sector in order to provide synergistic and long-term research support for the country's security system.
According to information from the RD&I IS, support has been provided (until March 2021) for 24 projects.

Over the long term, two characteristic groups of players have been forming in the security research community, whose notable activities are indispensable for meaningful operation of the system. The first one includes security research organisations, which act essentially as governmental laboratories, some faculties at institutions of higher education, and institutes of the Academy of Sciences of the Czech Republic. The other group is gradually becoming the community leader, particularly with the gradual materialization of outcomes of investment support of appreciably larger public funding providers. Both groups play a key role in the future development of security research in the Czech Republic and in meeting the transformation goals of the Intersectoral Framework of Security Research. The programme reflects the various degrees of specialization and internal capacities of key research organisations, as well as the need to maintain and restore the ability to conduct research in certain special fields of interest which have received little attention in terms of research support in the Czech Republic.

The programme comprises three profoundly different sub-programmes:

- Sub-programme 1 aims to interlink and integrate complementary research projects carried out by institutions which have already developed individual abilities. The goal of this sub-programme is to provide long-term coordinated research support for security system capabilities.
- Sub-programme 2 focuses on organisations with a superior background and facilities and extensive general abilities. The sub-programme offers the option to establish small-size teams specialized in security research, possibly leading to a diversification of resources and to a more profound societal impact of research activities at these institutions. The goal of this sub-programme is to advance the growth of research teams which have specialized in security research for a long time.
- Sub-programme 3 focuses on creating, maintaining and deepening international cooperation in security research. In view of shrinking national resources for security research, it is becoming increasingly important to ensure that organisations which have been involved in the field on a long-term and consistent basis continue to maintain and deepen those contacts which promise to diversify funding and/or human resources development. This sub-programme aims to promote internationalization initiatives in the security research community.

Amount of funding planned for the entire programme period (according to current conditions of the programme)

Period	2019	2020	2021	2022	2023	2024	2025	Total
Amount of aid (CZK)	30,000 thous.	200,000 thous.	200,000 thous.	200,000 thous.	200,000 thous.	200,000 thous.	200,000 thous.	1,230,000 thous.

Project period
The programme is planned for the period from 1 January 2019 to 31 December 2025. Public tenders for research, experimental development and innovation projects under the programme will be held according to individual sub-programme schedules. The first public tender is announced in 2020 (in sub-programme 1) and funding is to be released in the same year. Further public tenders will be announced depending on the available funding and the objectives of the programme. Projects implemented under the programme must be completed by 31 December 2025 at the latest.

Form and amount of funding
As the programme is intended exclusively for research organisations, 100% aid rate is expected to apply to all projects under the programme.

Aid beneficiaries
In accordance with the Support of Research and Development Act No. 130/2002 Sb., those eligible for funding include:

- **Research organisations** – legal entities which meet the definition of a research organisation given in the Support of Research and Development Act No. 130/2002 Sb. and in the Framework, which carry out the project alone or in cooperation with other participants.

3.6.4 Programme of Security Research of the Czech Republic 2021 – 2026: development, testing and evaluation of new security technologies - SECTECH (VB)

The main objective of the programme is to mobilize the potential of the business sector, namely SMEs, to take part in the development and transfer of new security technologies and to advance to a new level of technology and engineering which will enable Czech national security agencies to acquire, adopt, maintain and develop specific abilities for safeguarding the state and its citizens. The programme assists the business and research sectors in overcoming barriers to innovation in order to deploy new technologies. The programme focuses on experimental development projects. The primary target group is the business sector and its collaboration with research organisations. End users play an important role in the programme since they are the key to implementation across all the

stages from specifying the need for innovation through testing innovative solutions to their implementation. These strengthened links to practical applications will also contribute to research excellence.

The programme will offer two types of calls:

- Calls for proposals to meet the development needs of security and rescue services with specific project themes and identification of a specialist supervisor who also acts as a testing authority. These calls will address needs identified by users as part of analysis under MKBV2017+ (Intersectoral Framework of Security Research Support in the Czech Republic 2017–2023) or under other programmes, where commercial distribution is necessary to achieve the maximum security benefit due to their specific nature.
- An open call for proposals of development projects with a broad general specification which focuses on security applications in one or more technology areas. This concerns predominantly the technology areas in which the programme aims to support the goals of relevant parts the RIS3 strategy, the Innovation Strategy and thematic strategies, such as Industry 4.0 or the Artificial Intelligence Strategy in the Czech Republic.

Amount of funding planned for the entire programme period (according to current conditions of the programme) *(would it be possible to express these amounts more clearly? Is 100,000 thous. = a hundred thousand thousands? How many million/billion is it?)*

Period	2022	2023	2024	2025	2026	Total
(Amount of aid (CZK)	100,000 thous.	100,000 thous.	100,000 thous.	100,000 thous.	100,000 thous.	500,000 thous.

Project period
The programme is planned for the period from 1 January 2021 to 31 December 2026. A public tender is expected to be announced in 2021. Under the programme, a total of three public tenders are to be announced. The typical project duration is 24 months.

Form and amount of funding
Under the programme, experimental development efforts by research organisations will receive aid up to 100%. Undertakings may receive size-dependent aid of 25%, 35% or 45% of costs. Where effective collaboration is demonstrated, the aid may reach 40%, 50% or 60% of costs.

Aid beneficiaries
Applicants or beneficiaries under the Act, the Framework and GBER may include the following:

- Research and knowledge dissemination organisations – legal entities which meet the definition of a research organisation according to Article 2, section 83 of the GBER and the Act and which carry out the project in cooperation with other participants.
- Undertakings – legal entities, regardless of their legal form, and natural persons which (according to Annex 1 to the GBER) conduct economic activities, carry out the project alone or in cooperation with other participants, and can prove their ability to co-fund the project from non-public resources.

3.6.5. Public tenders

Code	Tender end date
VJ	03/05/2021
VB	06/05/2021

3.6.6 Contacts and additional information

Ministry of the Interior of the Czech Republic
Education and Police Academy Administration Section
Department of Research and Development
Nad Štolou 3, 170 00 Praha 7, Czech Republic
Phone: +420 974 833 268,
e-mail: vyzkum@mvcr.cz

Links:
www.mvcr.cz
https://www.mvcr.cz/vyzkum/

3.7 Ministry of Health (MH)

The Ministry of Health runs the Programme to Support Applied Medical Research and Development for 2015–2022 (where projects are coming to an end) and Programme to Support Applied Medical Research and Development for 2020-2026.

3.7.1 Programme to Support Applied Medical Research and Development 2015–2022 (NV)

The decisive precondition for economic, social and individual-oriented success of a society is healthy population. Essential to what is understood as health is the dynamics of changes and various processes which, however, show considerable inertia. As a result, numerous discrepancies arise, the most notable of which are those between the advances of medicine and the economic capacities of the country. Medicine must focus must on the most widespread and most severe threats: chronic non-infectious diseases, such as cardiovascular and cerebrovascular diseases, cancer, dementia and other mental diseases, or chronic diseases of the musculoskeletal system, and others. Attention must be paid to effects of the environment, which are changing profoundly. It is important to support the creation and evolution of new treatments and techniques (such as genetics and nanotechnology). New infectious diseases and the ever increasing resistance of new agents must be monitored. In response, virology and other disciplines must be supported. Fighting chronic non-infectious lifestyle diseases caused mostly by the unhealthy behaviour of a large part of the population will be a major challenge. The mission of the health care system is to adapt to the changing environment, knowledge, and society in order to provide all citizens with guaranteed access to health support and protection, to encourage healthy lifestyle, and enforce the rules of effective disease prevention.
According to information from the RD&I IS, support has been provided (until March 2021) for 547 projects.

3.7.2 Programme to Support Applied Medical Research and Development 2020–2026 (NU)

The main goal of the programme is to improve the health of the Czech population in both medium and long terms through the output and outcomes of the projects and to continue to fulfil current needs of the national health sector. The projects will generate new findings and knowledge to enhance clinical procedures in diagnosis, treatment and prevention of the most widespread as well as rare and new diseases. The programme also aims to bring the medical research in the Czech Republic to a level comparable to that in developed member states of the European Union. The programme covers three principal areas: Origin and evolution of diseases, New diagnostic and therapeutic methods, and Epidemiology and prevention of the most serious diseases; these are subdivided into 21 sub-areas and 43 sub-objectives. Specific targets are related to the sub-areas.
According to information from the RD&I IS, support has been provided (until March 2021) for 97 projects.

Amount of funding planned for the entire programme period (according to current conditions of the programme)

Period	2020	2021	2022	2023	2024	2025	2026	Total
Amount of aid (CZK)	300,000 thous.	750,000 thous.	1,050,000 thous.	1,300,000 thous.	1,050,000 thous.	750,000 thous.	300,000 thous.	5,500,000 thous.

Project period
The programme is planned for 7 years from 2020 to 2026. The project period is to be between 3 and 5 years. It will be defined separately for each public tender for research, experimental development and innovation projects with respect to optimal use of the available state budget funds. Projects implemented under the programme must be completed by 31 December 2026 at the latest. Details are given in the relevant tender dossiers.

Form and amount of funding
Funding is provided to legal entities and natural persons in the form of grants for approved costs. By contrast, the support for organisational units of the state and organisational units of ministries takes the form of increased expenditure limits.

The aid intensity defined as a percentage of approved project costs will be calculated separately for each project, each recipient, and each additional participant according to the GBER, and the Framework. Pursuant to Act No. 130/2002 Sb., the and the GBER, the maximum allowed aid intensity in a single project conducted by only research organisations can reach 100% of the approved costs. It will cover non-economic activities of research organisations under section 19 et seq. of the Framework.

Aid beneficiaries
According to Support of Research and Development Act No. 130/2002 Sb., the GBER and the Framework, eligible applicant entities, aid beneficiaries, and other participants are the following:

- **Research organisations** – legal entities which, according to the GBER, meet the definition of a research organisation, carry out the project alone or in cooperation with other participants, and prove their ability to co-fund the project from non-public resources.
- **Undertakings** – legal entities and natural persons which, according to Annex 1 to the GBER, conduct economic activities, carry out the project alone or in cooperation with other participants, and prove their ability to co-fund the project from non-public resources. Under section 1(4)(a) of GBER, no undertaking subject to an outstanding recovery order may qualify as a beneficiary.

3.7.3 Public tenders

The projects under NV programme are coming to an end. No new calls for proposals will be announced. Under the follow-on Programme to Support Applied Medical Research and Development for 2020–2026, a public tender is to be announced in 2021.

3.7.4 Contacts and additional information

Czech Agency for Healthcare Research (AZV CR)
Ministry of Health of the Czech Republic
Department of Science and Research
(Czech Agency for Healthcare Research)
Ruská 2412/85, 100 05 Praha 10, Czech Republic
Martina Lišková, Secretariat
Phone: +420 271 019 257
e-mail: martina.liskova@azvcr.cz

Links:
www.mzcr.cz
www.azvcr.cz

3.8 Ministry of Agriculture (MA)

At the Ministry of Agriculture, a programme entitled Programme for Applied Research of the Ministry of Agriculture for 2017–2025, “Earth”.

3.8.1 Programme for applied research of the Ministry of Agriculture for 2017–2025, EARTH (QK)

The programme supports applied research projects in agriculture, the food sector, water management and forestry which promise high innovation potential and improvement in the stability, volume and quality of production and are aimed at new products, technologies and production processes. The programme will stimulate the advancement of existing disciplines and technologies and inspire creation of new knowledge, methods and procedures, boosting the competitiveness of the Czech agricultural sector and expanding the use of renewable resources for the benefit of the society.
It also aims to improve the effectiveness of public funding of agricultural research and the general recognition of the importance of research.
According to information from the RD&I IS, support has been provided (until March 2021) for 201 projects.

Amount of funding planned for the entire programme period (according to current conditions of the programme)

Period	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Amount of aid (CZK)	50,647 thous.	156,062 thous.	490,000 thous.	490,000 thous.	600,000 thous.	600,000 thous.	600,000 thous.	300,000 thous.	270,000 thous.	3,556,709 thous.

Project period
The programme is planned for 9 years from 2017 to 2025.
Under the programme, the first public tender for research, experimental development and innovation (“public tender”) was announced in 2016 and the funding is to be released in 2017. It was followed by public tenders in 2017 and 2018. Further public tenders were to be announced in 2020, 2021 and 2022. Overall, six public tenders were to be announced with their funding released in the years 2017, 2018, 2019, 2021, 2022 and 2023. The projects for the public tenders announced in 2021 and 2022 shall have periods of maximum 4 and 3 years, respectively.

Form and amount of funding
Funding will be provided in the form of grants for approved costs to legal and natural persons, and in the form of increased expenditures to organisational units of the state, organisational units of regional self-government units or organisational units of ministries engaged in research and development.
The aid intensity shall be calculated separately for each project, each beneficiary and each additional participant in accordance with specifications for individual sub-programmes. No funding shall be provided to undertakings in difficulty, as defined in Article 2, section 14 of the ABER or Article 2, section 18 of the GBER, and to enterprises that are subject to an outstanding recovery order following a previous Commission decision declaring an aid illegal and incompatible with the internal market (Article 1 (5) (a) of the ABER and Article 1 (4) (a) of the GBER). Under these projects, it is prohibited to use additional funding to cover the same eligible costs from other national or European resources. Applicant entities are therefore required to report any public funding they have received for an identical or similar project or part of project.

The aid intensity for each beneficiary and other project participants shall be no higher than stipulated in the ABER and GBER. In accordance with Article 25, section 6 of the GBER, surcharges may be provided on top of this basic aid intensity. The maximum surcharge levels are given in the programme conditions and this information shall also be included in the tender dossier for public tenders. The funding provider shall determine the maximum aid intensity for research organisations and for research in specific areas of the agricultural sector in accordance with European regulations and the rules of the programme. Pursuant to Article 9 of the GBER, the required information about the aid amount and the beneficiary, as defined in Annex III to the GBER, shall be published for each individual aid amount in excess of €500,000.

Under the programme, the aid intensity stipulated for research and development in agriculture, forestry, fishery and aquaculture may be used in accordance with the above-listed European regulations. The maximum aid intensity determined by the funding provider may reach 100% of the approved costs under conditions applicable to every beneficiary and other project participants (Article 31 of the ABER and Article 30 of the GBER).

Aid beneficiaries
According to Czech and EU legislation (identified in the programme conditions), eligible applicant entities and aid beneficiaries are research organisations and, in the role of additional participants, undertakings (as specified in the conditions for individual sub-programmes in chapter 15).

Research organisations which are defined in the ABER and GBER as “research and knowledge dissemination organisations” include entities regardless of their legal standing and method of funding, whose principal aim is to conduct independent basic research, industrial research or experimental development or publicly disseminate the results of such activities through instruction, publications and knowledge transfer. Where such entities also pursue economic activities, the funding, costs and revenues relating to these economic activities must be accounted for separately. Undertakings that can exert influence upon such entities, for example, shareholders or members, cannot enjoy preferential access to their research capacities or to the results generated by those entities.
Undertakings are those legal entities (legal and natural persons), regardless of legal form, which (according to Annex I to the ABER and GBER) carry out the project alone or in cooperation with other participants, and prove their ability to co-fund the project from non-public resources.

3.8.2 Public tenders

The public tender under the Earth programme was announced in March 2021. The tender period ends on 5 May 2021.

3.8.3 Contacts and additional information

The Ministry of Agriculture of the Czech Republic has established the National Agency for Agricultural Research. The Agency is part of the Research, Education and Consultancy Department of the Ministry. In cooperation with programme committees appointed by the Deputy Minister of Agriculture, it conducts public tenders for R&D projects according to the conditions and criteria identified by the Ministry. On an annual basis, the Agency organises evaluations of interim and final project reports.

Ministry of Agriculture of the Czech Republic
Research, Education and Consultancy Department
National Agency for Agricultural Research
Těšnov 65/17, Praha 1, 110 00, Czech Republic
e-mail: info@mze.cz

Links:
www.eagri.cz
http://eagri.cz/public/web/mze/poradenstvi-a-vyzkum/vyzkum-a-vyvoj/narodni-agentura-pro-zemedelsky-vyzkum/

3.9 Overview of calls under current support programmes

Public funding provider	Programme code	Name of activity	Start	End	Call in 2021	Future calls
CSF	GA	Standard projects	1993	-	Y	Y
CSF	GC	International projects	1994	-	Y	Y
CSF	GF	LA grants	2014	-	Y	Y
CSF	GH	ERC grants	2017	-	Y	Y
CSF	GX	EXPRO, excellence in basic research	2018	-	Y	Y
CSF	GM	JUNIOR STAR	2020	-	Y	Y
CSF	GN	POSTDOC INDIVIDUAL FELLOWSHIP	2021		Y	Y
TA CR	TP	GAMA 2	2020	2022	Y	N
TA CR	TI	BETA 2	2017	2024	Y	Y
TA CR	TJ	ZETA	2017	2025	N	A (Sigma)
TA CR	TK	THETA	2018	2025	Y	Y
TA CR	TL	ETA	2018	2023	N	A (Sigma)
TA CR	TN	National Centres of Competence 1	2018	2022	N	N
TA CR/ MIT	FW	TREND	2020	2027	Y	Y
TACR/ME	SS	Environment for life	2020	2026	Y	Y
TACR/MT	CK	TRANSPORT 2020+	2020	2026	Y	Y
MD	OZ	Ambition	2020	2026	Y	Y
MIT	FX	The Country for Future	2020	2027	Y	Y
MI	VJ	Strategic support for advancement of security research in the Czech Republic IMPACT 1	2019	2025	Y	Y
MI	VB	Programme for Security Research of the Czech Republic SECTECH	2021	2026	Y	Y
MH	NU	Programme to Support Applied Medical Research and Development 2020-2026	2020	2026	Y	Y
MA	QK	Programme for applied research, EARTH 2017–2025	2017	2025	Y	Y

Running tenders can be found on the R&DC website at https://www.rvvi.cz/ves?s=probihajici-souteze

4. PROGRAMMES FOR SUPPORT OF RESEARCH AND DEVELOPMENT IN THE CZECH REPUBLIC

In previous Guides, this chapter used to be devoted to the Enterprise and Innovation for Competitiveness Operational Programme 2014–2020 (EICOP), and the Research, Development and Education Operational Programme (RDEOP). Both programmes were planned to end in 2020. Although a small amount of funds remains to be distributed under EICOP (since the use of its funds was hampered by numerous obstacles), this Guide will only cover these programmes very briefly. The programmes which define the aid available until 2027 are more relevant now.

On 1 March 2021, the government of the Czech Republic *(see below*) approved allocations for operational programmes which Czech beneficiaries can use in the 2021-2027 period. It is a fundamental step in the country's finalisation of the programmes and on its path to negotiations with the European Commission.
In the new programming period, Czechia *(which is right? Best to be consistent?)*can receive CZK 550 billion from the European funding for cohesion policy. Additional funds up to CZK 960 billion from other European initiatives will be available to Czechia. Understandably, a majority of these funds is not intended for R&D.
Individual operational programmes and their final allocations:

Programme	administered by	**Allocation after approx. 75% has been distributed**	**Final state**
OP D	MT	**CZK 72.6 billion**	**CZK 125 billion**
IROP	MRD	**CZK 72.3 billion**	**CZK 122.7 billion**
TACOP	MIT	**CZK 71.5 billion**	**CZK 79.3 billion**
EOP	ME	**CZK 50.4 billion**	**CZK 61.1 billion**
JAKOP	MEYS	**CZK 40.9 billion**	**CZK 64.1 billion**
E+OP	MLSA	**CZK 28.8 billion**	**CZK 36.4 billion**

Clearly, the last 25% of the funds has been distributed unequally among the programmes. The approved allocation proposal was based on the Multiannual Financial Framework approved by the European Parliament and Council in December 2020. In the course of the discussions of the Partnership Agreement and operational programmes with the European Commission, some changes can be made to the allocations of operational programmes.

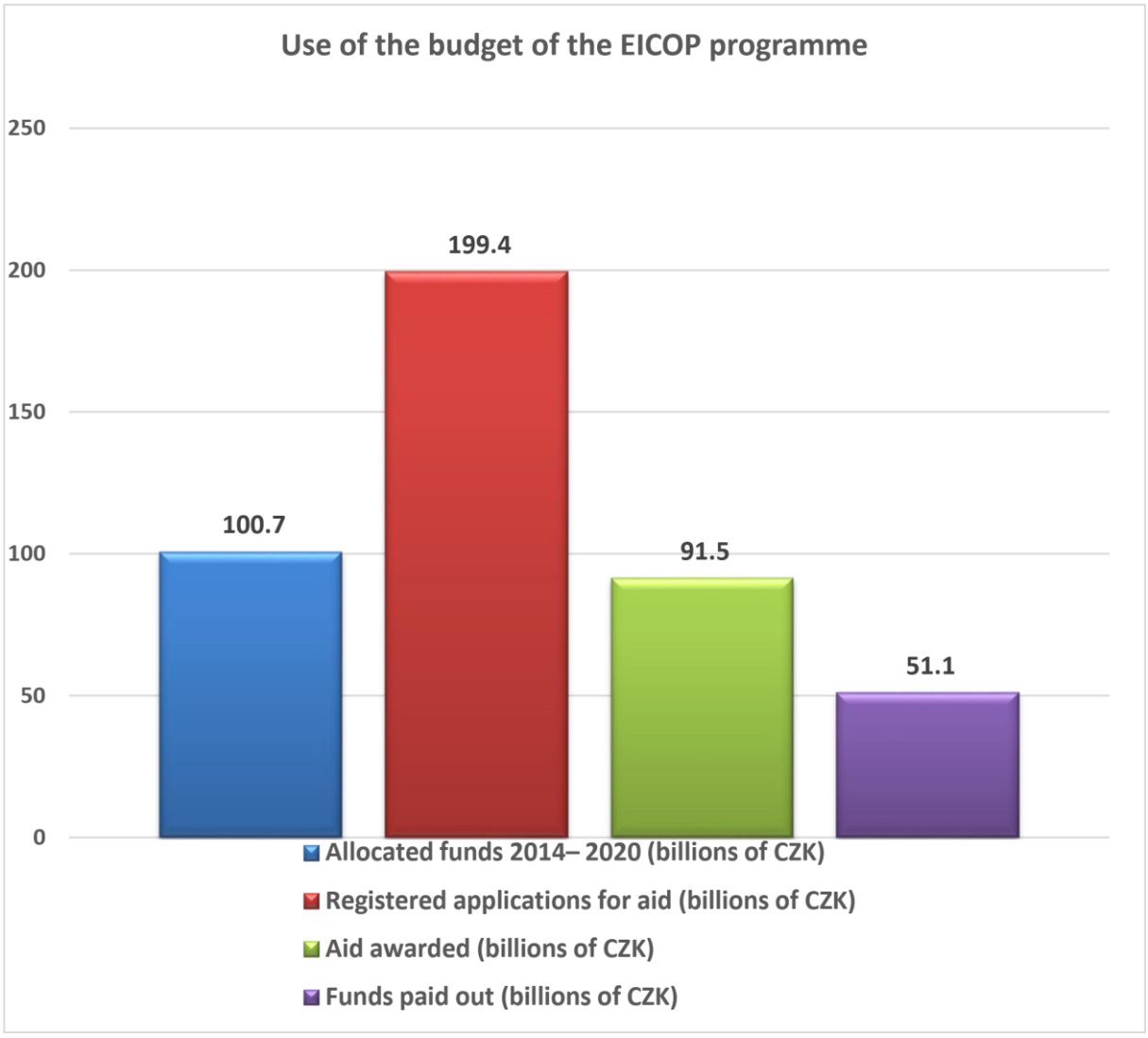
The first calls in the new 2021-2027 programming period for some programmes can be expected to be announced at the end of this year. A majority of these calls may be announced in the first half of 2022.

4.1 EICOP and RDEOP Operational Programmes

4.1.1 Enterprise and Innovation for Competitiveness Operational Programme 2014–2020

The objective of the Enterprise and Innovation for Competitiveness Operational Programme (EICOP) is to build competitive and sustainable economy based on knowledge and innovation. The competent managing authority is the Ministry of Industry and Trade and the authorized agency is the newly-established Business and Innovation Agency which took over after Czechinvest.

The original programme allocation was CZK 120 billion for the regions. Since then, it was reduced repeatedly to the final limit of CZK 100 billion but even today it has not been awarded in full.



Source: Ministry of Regional Development

Contacts and additional information

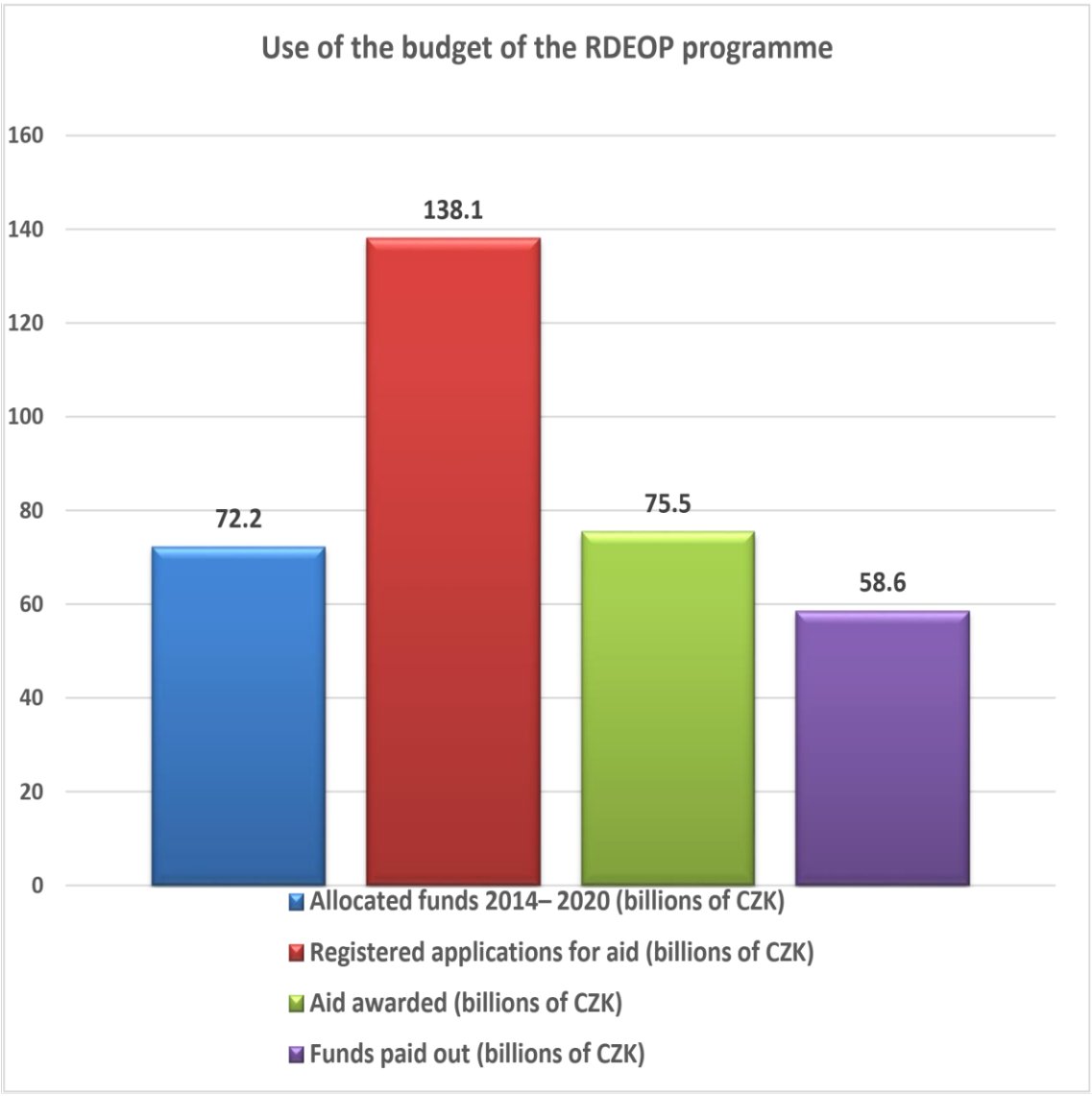
Ministry of Industry and Trade of the Czech Republic
Na Františku 32, 110 15 Praha 1, Czech Republic
Phone: +420 224 851 111
E-mail: posta@mpo.cz
https://www.mpo.cz/cz/podnikani/dotace-a-podpora-podnikani/oppik-2014-2020/

The schedule of the remaining calls can be found at:
https://www.mpo.cz/cz/podnikani/dotace-a-podpora-podnikani/oppik-2014-2020/vyzvy-op-pik-2021/harmonogram-vyzev-op-pik-pro-rok-2021--260223/

4.1.2 The Research, Development and Education Operational Programme (RDEOP)

The objective of the Research, Development and Education Operational Programme (RDEOP) is to help shift the Czech economy towards a competitive economy based on a qualified, motivated and creative labour force, high-quality research results and their use. Managing Authority is the Ministry of Education, Youth and Sport of the Czech Republic.

The programme's allocated funds have been used up and increased repeatedly. No further R&D calls will be announced and the remaining funds will go to the already approved projects.



Source: Ministry of Regional Development

Contacts and additional information

Ministry of Education, Youth and Sport
Managing Authority, OP VVV
Karmelitská 7, 118 12 Praha 1, Czech Republic

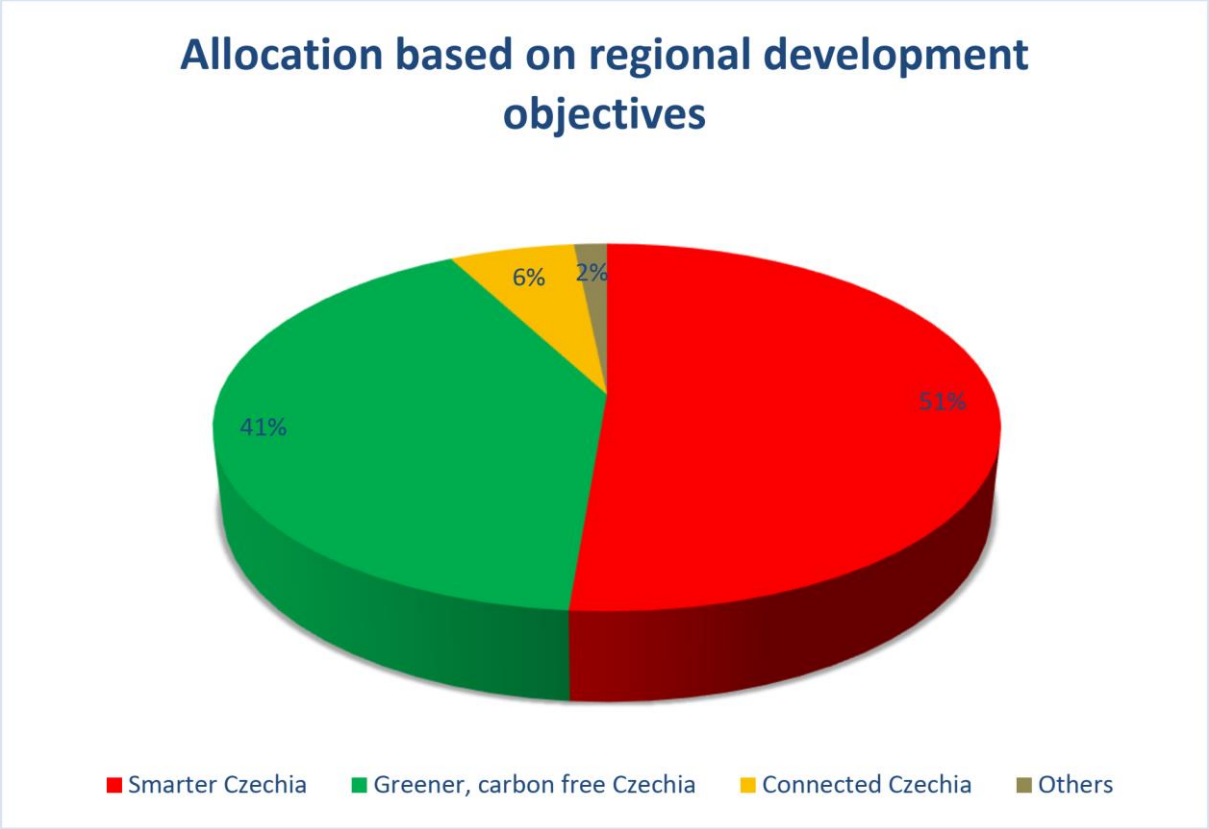
Links:
https://opvvv.msmt.cz/

4.2 Technology and Applications for Competitiveness Operational Programme 2021-2027 (TACOP)

TACOP (the original working name of the programme was OP Competitiveness) will follow up on EICOP and build on the experience gained in that programme. The chart below shows the key objectives of Europe's cohesion and regional development policy. TACOP will meet the objectives in areas 1 and 2 and, to a lesser extent, in area 3. The funds allocated to the remaining areas are minimal.

Source: https://www.agentura-api.org/cs/op-tak/

The percentages of allocations to individual objectives under TACOP are shown in the following chart:



Source: brochure issued by the national coordination body attached to the Ministry of Regional Development

4.2.1 Structure of the programme

The total allocation of the programme is EUR 3.1 billion, which is approx. CZK 80 billion. There are five priorities under the programme:

- Priority 1: Strengthening the performance of enterprises in research, development and innovation and their digital transformation
- Priority 2: Development of SMEs' entrepreneurship and competitiveness
- Priority 3: Growth of digital infrastructure
- Priority 4: Transition to low-carbon economy
- Priority 5: Effective use of resources

The priorities of TACOP are embodied in specific objectives for which calls will be announced to support relevant activities. There are three specific objectives which focus on research and development or R&D support.

SO 1.1: Strengthening research and innovation capacities and adopting advanced technologies

Planned allocation: CZK 24 billion. Both SMEs and large enterprises are eligible. The programme follows on efforts under EICOP. Innovation Vouchers, Proof of Concept, Innovation, Application, Potential, Knowledge Transfer Partnership, Collaboration, Infrastructure Services.

Activities supported:

- research and development by enterprises, implementing innovation in businesses, commercialization, verification of research and development results, launching on the market
- fostering knowledge transfer and collaboration between enterprises and research institutions
- implementation and advancement of digital and other advanced innovation technologies in enterprises
- building and developing the infrastructure for research and development by enterprises, testing and validation of technologies

- innovation vouchers
- shared capacities for research, development and innovation – clusters, technology platforms
- supporting the business infrastructure to address the needs of SMEs (hubs/co-working centres, business incubators, science and technology parks)

SO 1.2: Leveraging the benefits of digitalisation for citizens, enterprises, research organisations and governments

Planned allocation: CZK 7 billion. The size of eligible enterprises – only SMEs. Builds on EICOP programmes: ICT and Strategic Services, Technologies.

Activities supported:

- digitalisation in enterprises, including process analysis and deployment of digital solutions (AI, automation and robotisation, cyber security and others), fostering vocational training and education of employees related to implementation of new technologies in companies,
- acquisition of high-performance computing equipment, HPC
- development and acquisition of specialized software (cyber security, simulations, monitoring, computer vision, Big Data Analytics, 3D printing and others)
- advanced technologies (e.g. block-chain, virtual reality and others) for economy development
- building and upgrading computing and data centres

SO 2.1 Boost the growth and competitiveness of small and medium-sized enterprises

The size of eligible enterprises – only SMEs. Builds on EICOP programmes: Technologies.

Activities supported:

- procurement of new process machinery and equipment, including relevant infrastructure, linking newly-procured or existing technology using the latest communication channels and protocols (autonomous bi-directional communication).
- support, advisory and consultancy services across all stages of formation and growth of an SME from pre-incubation through start-up and spin-off incubation to scale-up
- consultancy for SMEs focusing on enterprise development, expansion of business activities, improving the quality and effectiveness of production and services with focus on expanding the market potential
- support for enterprises which upgrade their business infrastructure, conduct brownfield redevelopment, transformation and further development of technically outdated facilities into business premises suitable for SMEs
- participation of SMEs in foreign trade fairs and exhibitions, organizing and participating in other symposia, seminars and events abroad, particularly in key technology sectors to enable them to enter foreign markets
- facilitating the access of SMEs to external funding for their further development, innovative solutions, investment and competitiveness, supporting the formation of SMEs and access to loans and alternative equity and quasi-equity instruments

The other specific objectives proposed will not promote investment in research and development, except minor involvement in a particular call.

Besides grants, other financial facilities will be available for a majority of the specific objectives. The implementation of each particular financial facility will be based on ex ante assessment. The existing guarantee, loan and equity schemes will be complemented with a combination of a financial facility and a grant. Cooperation with the Czech-Moravian Guarantee and Development Bank and EIB Group is expected to continue. The Ministry of Industry and Trade of the Czech Republic prefers a territorially-specific approach, which involves territorially-focused calls (which can be tailored to the economy of the territory) and bonuses for applications (most likely reflecting a market indicator other than unemployment rate as used today).

FF schemes:

- **Loan and guarantee FFs** - Building on favourable experience with EXPANSION programme (EICOP), the Ministry of Industry and Trade plans to continue programmes which offer

favourable loans, loans with financial grant and bank guarantees, in particular for SO 2.1 (boosting the growth and competitiveness of SMEs).

- **Venture capital FF with optional grant** - This is envisaged particularly for SO 2.1 (boost the growth and competitiveness of SMEs), SO 1.1 (strengthen research and innovation capacities and adopting advanced technologies) and SO 1.2 (leverage the benefits of digitisation for citizens, enterprises and governments). MIT anticipates that the financial facility will be combined with a grant where this solution is substantiated.

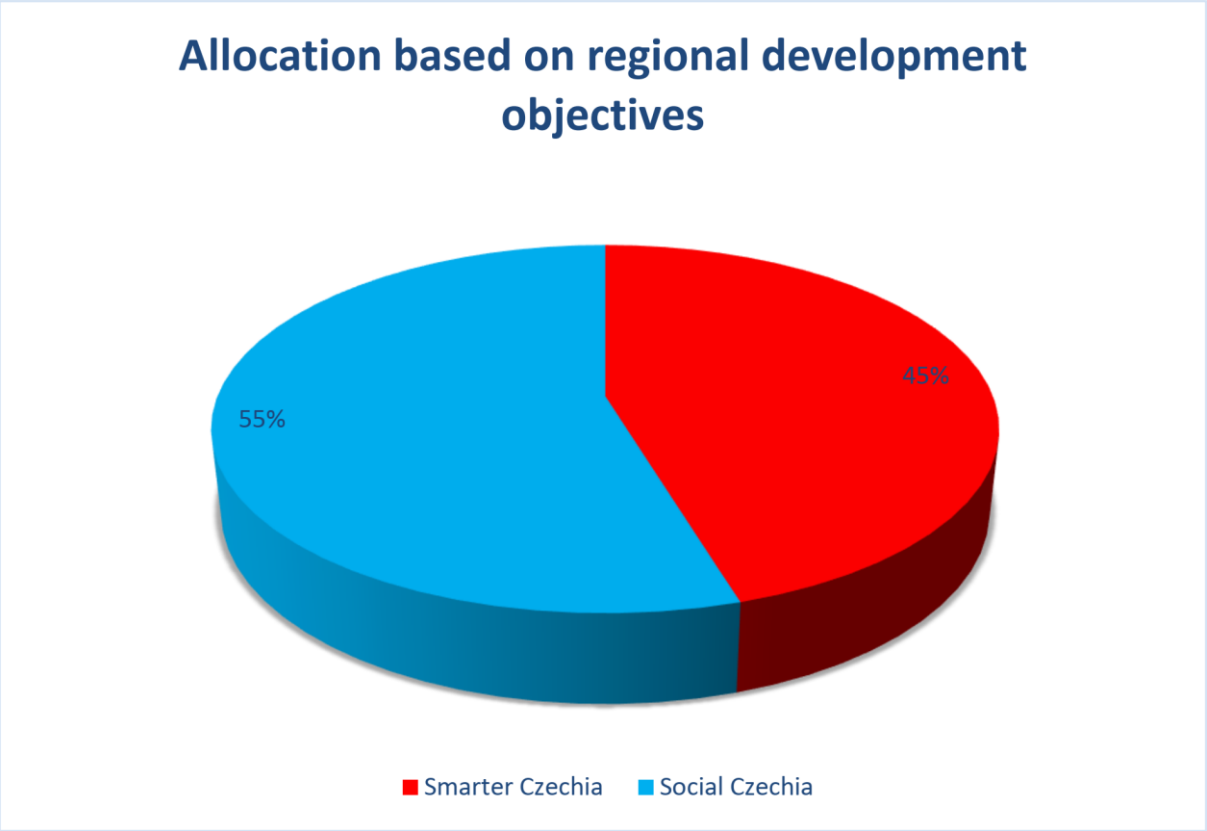
More information will be available at https://www.agentura-api.org/cs/op-tak/

4.3 Jan Amos Komenský Operational Programme 2021-2027 (JAKOP)

Jan Amos Komenský Operational Programme is based on the national policy for education, research and development and follows on from the successful RDEOP programme. The experience acquired under RDEOP, the areas which received aid under the programme and the mechanisms which have been created form the foundations for JAKOP, a programme that continues to deepen and strengthen the favourable effects of previous interventions and changes in education, research and development..

In order to accomplish any changes, the focus must be on equal opportunities and justice in education as well as upgrading the content and methods of education to facilitate access to job positions which require high qualifications, economic transformation and adaptability in one's career to protect from unemployment and poverty. Excellence and support for high-quality research and development is particularly important in those areas which have the potential to contribute to further development of society and the economy and address societal challenges on both national and European levels. Research and education are essential for our future.

The percentages of allocations to individual objectives under JAKOP are shown in the following chart:



4.3.1 Structure of the programme

The Czech Republic (Czechia?) lags behind world leaders in research, development and innovation, as it falls in the category of “moderate innovators”. The support for research and development must aim at developing state-of-the-art resources (human resources as well as infrastructure), fostering the

knowledge potential available to Czech facilities, focusing on current and future societal challenges and building a base for future applicability of results from research and development in practice. This is the only path which can make the Czech economy competitive with developed countries.

JAKOP will boost the competitiveness of the Czech Republic in research and development by strengthening the capacities for high-quality research and usability of RDI results.

- Strengthening internationalization and developing the institutional environment in research organisations.
- Opening up the research system and helping research teams from Czech research organisations get involved in international projects.
- Strengthening the collaboration of research organisations with industry, improving the applicability of RDI results and focusing the research activities in research organisations to high-potential application-relevant fields.
- Securing sufficient numbers of qualified staff in research and development.
- Providing up-to-date research infrastructures.
- Driving research excellence in areas identified as national RDI priorities

The total allocation of the programme is EUR 2.47 billion, which is approx. CZK 64 billion. The programme only has two priorities which define its structure.

- Priority 1 – Research and Development
- Priority 2 – Education

The priorities of JAKOP are embodied in specific objectives for which calls will be announced to support relevant activities. Research and development will receive aid under the first priority, specific objective 1 and, to a limited extent, 2.

SO 1.1 Strengthen research and innovation capacities and adopt advanced technologies
The type of applicant and the form of support are dictated by the particular call. Activities supported:

- institutional environment of research organisations, internationalization and development of human potential
- growth of application potential of research organisations
- excellence in research
- synergies/complementarity with Horizon Europe
- infrastructure for RDI
- national-level systematic measures fostering the research and innovation environment

SO 1.2 Foster the skills for smart specialisation, industrial transition and entrepreneurship

Eligible applicants and the form of aid will be specified for each call. Activities supported:

- involvement of participants/stakeholders in effective and long-term prioritisation of RDI policy
- promoting collaboration between institutions (including specialised national and regional agencies and others)
- adoption of experience and best practice from abroad
- survey and analysis of the research and innovation environment, evaluation of current and future demand of the economy and society, identification of opportunities and evaluation of policies and strategies focused on RDI and technologies and their tools
- evaluation of the impact of new technologies on society in line with the principles of responsible research and innovation
- promoting the networking of entities in the research and innovation environment, tearing down barriers
- supporting the design/preparation and implementation of specific new/updated regional strategic tools/interventions to strengthen regional innovation systems and advancing smart specialisation of regions

More information will be available at https://opvvv.msmt.cz/2021-plus.

4.4 National Recovery Plan (NRP)

At its meeting in July 2020, EU leaders agreed on a stimulus package and a budget for 2021–2027 to help EU countries recover from the pandemic and to boost investment in green and digital transformation.

The comprehensive package of EUR 1.8 billion comprises the following elements:

- Multiannual financial framework
- Special fund for economic recovery as part of the NextGeneration EU tool (NGEU).

The total budget for NGEU is EUR 750 billion, of which 390 billion is to be awarded through grants and 360 billion as loans. Under NGEU, funding will be distributed to seven programmes:

- Recovery and Resilience Facility – RRF, EUR 313 billion in grant funding)
- Horizon Europe
- InvestEU
- Rural Development Programme
- Just Transition Fund
- ReactEU
- RescEU.

Rather than a conventional operational programme, it is a financial facility of the EU to help recovery from the coronavirus pandemic. Member states may submit national recovery plans to the European Commission to apply for funding from RRF. The Czech plan bears the name National Recovery Plan (NRP). The plan covers the three full years during which contracts with RRF can be made (2021-2023). It will be revised in 2022, the year when the allocation for the final third year will be known. Preparations are coming to an end. The budget for the National Recovery Plan may reach CZK 180 billion which Czechia may receive from the Recovery and Resilience Facility. Research and development is to be one of its priorities. The priorities, also referred to as pillars, comprise specific components:

Pillar 1 Digital transformation
- 1.1 Digital services for citizens and companies
- 1.2 Digital systems of state administration
- 1.3 Digital high-speed networks
- 1.4 Digital economy and society, innovative start-ups and new technologies
- 1.5 Digital transformation of enterprises
- 1.6 Development of culture and creative sectors
- 1.7 Shortening and digitisation of building permit proceedings
- 1.8 Digital access to the justice system
- 1.9 Digital access to archives

Pillar 2 Physical infrastructure and green transition
- 2.1 Sustainable and safe transport
- 2.2 Reducing energy consumption
- 2.3 Transformation of industry and transition to cleaner energy sources
- 2.4 Development of clean mobility
- 2.5 Renovation of buildings and protection of air
- 2.6 Environmental protection and adaptation to climate change
- 2.7 Circular economy, recycling and industrial water
- 2.8 Brownfield redevelopment

Pillar 3 Education and labour market
- 3.1 Innovation in education in the digitalisation context
- 3.2 Adaptation of capacities and focus of school programmes
- 3.3 Modernization of employment services and development of labour market

Pillar 4 Institutions and business regulation and support in response to COVID-19
- 4.1 Systematic support of public investment
- 4.2 Investment support in industry and business

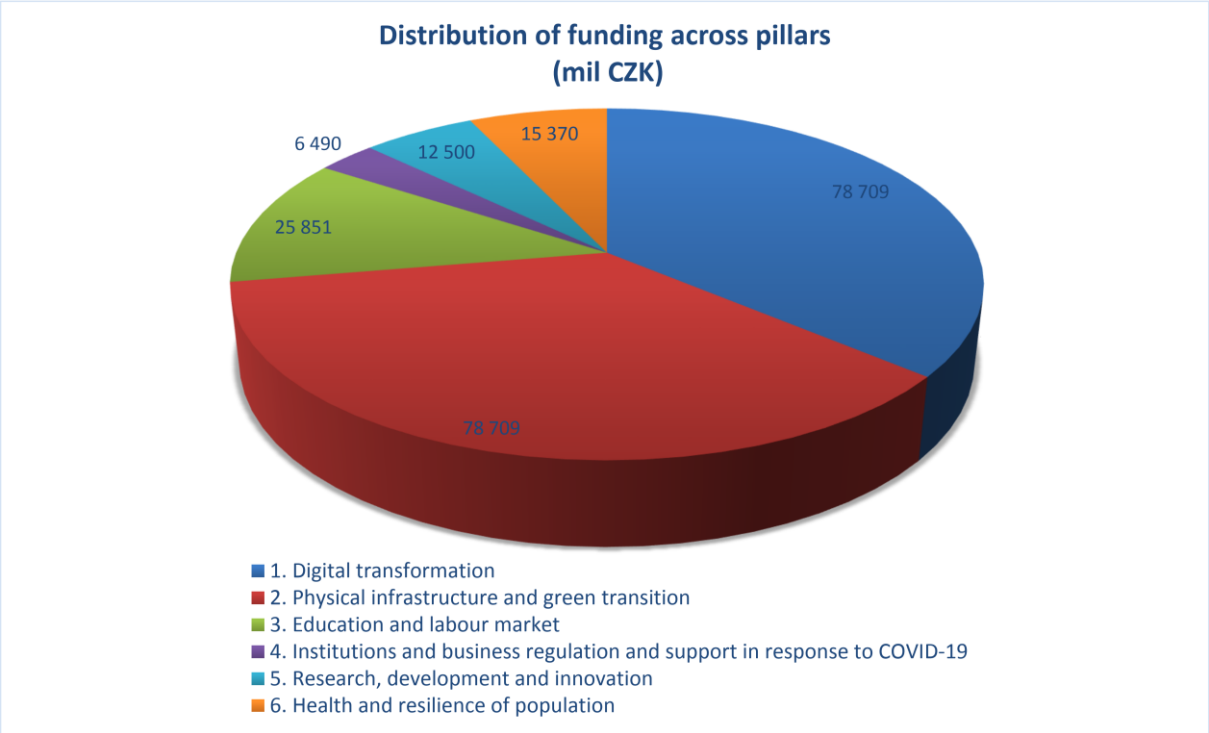
Pillar 5 Research, development and innovation
- 5.1 Excellence in research and development in priority areas of public interest

5.2 Support for research and development in enterprises and introducing innovation in enterprises

Pillar 6 Health and resilience of population

6.1 Improving the resilience of the healthcare system

6.2 Prevention of cancer



Source: National Recovery Plan

All the components must fall within the flagship initiatives:

- PowerUp – building and integrating renewables facilities
- Renovate – improvement of energy efficiency of buildings
- Recharge and Refuel – promotion of clean mobility
- Connect – rollout of rapid broadband services
- Modernise – EU-ID and upgrade to key digital public services
- Scale-up – build a European industrial cloud – digital transformation of the EU hinges on expanding the capacity of the European industrial data cloud and on the ability to build powerful, advanced computer processors
- Reskill and Upskill.

One of the key themes funded under the projects is the climate (37% of the total expenditure). This should help EU reach climate neutrality by 2050, which is part of the European Green Deal and in line with EU climate goals for 2030 and the Paris Agreement. In addition, national plans of member states should comply with the general “do no significant harm principle” according to EU classification. Another key area is the digital transformation of economies to accelerate the growth of added value and competitiveness of EU member states. This area is required to account for 20% of the total spending.

Components 5.1 and 5.2 are relevant to this publication as they involve support for research and development as the primary activity. Nevertheless, other components may support R&D to meet their primary goals as well.

4.4.1 Component 5.1 Excellence in research and development in priority areas of public interest

The purpose of the investment, i.e. “Systematic support for RDI in priority areas of medical sciences and related social sciences” , is to foster basic research in specific healthcare disciplines identified by the government. This primary investment in the science base in priority areas of healthcare research delivers a systemic change in that four to five national functional research bodies are to be formed to focus on branches of medicine involving high mortality, namely research into infectious diseases, cancer research, research into metabolic derangements and cardiovascular diseases or research into the socioeconomic impact of diseases.

The funding should eliminate the existing fragmentation, motivate the existing research hubs to associate and promote their cooperation and capacity sharing and upgrade across the Czech Republic. It will lead to the creation of one integrated national platform on the level of national scientific bodies, which will be seamlessly incorporated into the existing structure of research organisations and universities in the Czech Republic whose role will be to provide the required specialist and scientific background for state administration, the professional and general public and facilitate rapid and transparent sharing of relevant and scientifically-verified information and results of RDI at a new quality level in priority areas of healthcare research and across disciplines. With a stronger excellent scientific base, rapid response options and specialist support will be available to state administration in emergencies across their priority areas and the resilience of the entire healthcare system will improve.

The covid-19 crisis was both a challenge and an impetus for rapidly addressing the needs of the Czech Republic in scientific disciplines related to healthcare, as it revealed the inadequacy of the scientific base in some branches of medicine where statistically high mortality occurs, such as infectious diseases, cancer and metabolic derangements and cardiovascular diseases. The cross-sectoral field of socioeconomic impacts of such diseases is of key importance as well.

The costs of the entire component are estimated at CZK 5 billion, of which 1 billion is to be used in 2022. In 2023, the amount used is to be CZK 1.25 billion, in 2024, CZK 1 billion and in 2025, CZK 900 million. In the last year, when the expected investment is to be near zero, the remaining CZK 750 million is to be used.

The cost estimate is based on actual costs of completed projects under National Sustainability Programmes I and II.

4.4.2 Component 5.2 Support for research and development in enterprises and introducing innovation in enterprises

The purpose of this investment is to help restore the economy and strengthen its resilience by improving the competitiveness and flexibility of undertakings, specifically small and medium enterprises, by enhancing the innovation performance of existing companies and contributing to high-quality collaboration within the innovation ecosystem of the Czech Republic. It will be accomplished by supporting research and development conducted in collaboration between the private and public sectors and by helping innovative enterprise to rapidly embrace innovation with a special focus on fostering digitalisation in innovating existing procedures and organizational innovation with emphasis on international collaboration and synergistic effects with the framework programme which promotes research and innovation.

The cost estimate is based on specific calls listed in support programmes announced for 2020-2022. These calls have been planned on the basis of the limited resources of the Czech state budget. Up to now, these programmes have had an excess of high-quality projects eligible for aid. No more than approx. 10% of projects receive aid in some calls. With the contribution from RRF, more research and innovation projects can be supported which meet the programme objectives and facilitate reforms on both national and broader levels.

The total spending on the component, including co-funding from the Czech state budget, is approximately CZK 17 billion. The data on the contribution from the RRF tool varies in individual documents: from 7.5 billion to 8.2 billion.

By the end of April 2021, member states are to submit to the European Commission their programmes in the final form along with the National Reform Programme (NRP) for 2021. After that (within two months after submission), the EC will review the NRPs against pre-defined criteria and refer the successful ones to the Council of the European Union for approval.

The Council is to decide on the matter within four weeks. Following approval, the Czech Republic may apply for an advance payment of 13% pre-financing from the allocated support for the NRP.

This procedure shows that the NRP of the Czech Republic might be approved in mid-2021. However, the measures (reforms and investment) which have been launched since February 2020 and have been included in the NRP are now eligible for RRF funding.

5. INTERNATIONAL COOPERATION OF THE CZECH REPUBLIC IN RESEARCH AND DEVELOPMENT IN THE CONTEXT OF EU TOOLS

The fundamental tools used by the EU for funding research, development and innovation on the European level are framework programmes. The approved budget of Horizon 2020 (H2020) for 2014−2020 Horizon 2020 (H2020) is EUR 77.028 billion and the budget of EUROATOM is EUR 1.603 billion. For coming years, FP9 Horizon Europe is approved (HEU) with a budget of EUR 95 billion.

The Czech Republic sees as one of its priorities in international cooperation its engagement in the research and development structures of the European Union (European Research Area). This means, above all, effective participation in EU framework programmes of research and development, and in the EURATOM programme.
Czech research organisations still struggle in terms of their success rate in FP8 and in winning aid and therefore rank below the average in international comparison.

General priorities include developing, structuring and strengthening the European Research Area (Ljubljana Process), realizing the Europe 2020 strategy (achieving competitiveness comparable with the USA and Japan), and meeting the Barcelona objective (European R&D expenditures of 3 % of GDP). Other important efforts include multilateral and bilateral projects, and participation in international governmental and non-governmental organisations and activities.

Separate financial facilities and institutions were thus linked and implemented as part of the Horizon Europe framework programme. Hence, the division listed below does not follow split systems but refers to individual components connected with Horizon Europe. Since international collaboration cannot be separated completely, there are links to HEU in later chapters devoted to international collaboration in R&D. The purpose is to make the overview clearer. The division among chapters is one of the many possible options *(is this necessary here? Delete?).*

5.1 Horizon 2020

The Seventh Framework Programme of the EU, the predecessor of Horizon 2020, ran from 2007 to 2013 (some of its projects could continue until 2017). In the 2011–2013 period, the draft of the Horizon 2020 framework programme was prepared and discussed. It was approved by the EU Council on 3 December 2013. Its budget was EUR 77 billion. The programme is in its final stage. The follow-on programme Horizon Europe is already running.
Analyses compiled by the European Commission and the Technology Centre AS CR reveal that the Czech Republic remains in the group of member states least involved in framework programme H2020. In H2020, the Czech Republic was able to secure funding of EUR 418 million. The number of Czech applicants for participation in this framework programme was, as expected, substantially lower than in EU-15 states with a similar population. The number of the country's applicants in project proposals was almost 5% lower than in Hungary, whose population is substantially the same. The weak response of Czech applicants to H2020 calls is evidenced by the fact that among the EU-13 states, the number of participants (teams) in project proposals and the awarded projects per 1,000 FTE was only lower in Poland. Overall, Czechia ranks 25th in this indicator in the EU. Yet, some indicators are more favourable. The success rate of Czech team participants (16.29%) in H2020 is the highest in EU-13 and considerably higher than the overall success rate of EU-13 states (14.01%), and even slightly higher than the overall success rate of participants from the entire EU (16.00%) and EU-15 (16.25%). The success rate of the Czech participants exceeds that of many EU-15 states. This shows that once a Czech project application is submitted, its chance of success is above average.

All the statistical data on H2020 can be found on the website of the Technology Centre AS CR.
https://www.h2020.cz/files/Zprava-o-ucasti-Echo-5-6-2020.pdf

Main priorities of H2020
H2020 focuses on three priorities:

- Excellent science

- Industrial leadership
- Societal challenges

The H2020 budget also covers these efforts and initiatives:

- Non-Nuclear actions of the Joint Research Centre
- European Institute of Innovation and Technology
- Science with and for society
- Spreading excellence and widening participation

The budget of H2020

The budget of the H2020 programme was approved at EUR 77.028 billion with the structure given in the following table. Complementary to H2020 is the EURATOM programme, whose overall budget for the 2014–2020 period is EUR 1.603 billion.

Approved H2020 budget in millions of EUR

Priority	**Budget in millions of EUR**	**Proportion allocated**
I. Excellent science	24,441	31.73%
II. European industrial leadership	17,016	22.09%
III. Societal challenges	29,679	38.53%
EIT	2,711	3.52%
Science with and for society	462	0.60%
Spreading excellence and widening participation	816	1.06%
Non-nuclear direct actions of the Joint Research Centre	1,903	2.47%

Schedule of calls

Czech calls under the H2020 programme are available at:
https://www.h2020.cz/cs/seznamy/vyzvy

Further information can be found at these addresses:
https://www.evropskyvyzkum.cz/cs/nastroje-spoluprace/ramcove-programy/horizont2020
https://www.h2020.cz/cs
https://www.h2020.cz/files/svobodova/TCAV-brozura-Horizont-2020-web.pdf

5.1.1 Horizon 2020-related initiatives

The H2020 budget is used for additional horizontal activities – Spreading excellence and widening participation; Science with and for society – as well as non-nuclear activities of the Joint Research Centre EK and the European Institute of Innovation and Technology.. These activities are described below since they continue in Horizon Europe as well.

Following ERA-NET and ERA-NET Plus, the initiatives based on Article 185 of the Treaty on the Functioning of the European Union (ex Article 169 of the Treaty establishing the European Community) represent a higher level of coordination of research programmes. They integrate entire national research programmes, including their management and funding, and even generate joint calls for proposals. In order to jointly realize such an initiative, a new implementation structure must be created to deal with the responsibility for managing the joint programme and its financial matters. Under Article 185 and Horizon 2020, four joint programmes are under way which were already running under FP7 (approved by the European Parliament and EU Council). A proposal for resuming the fifth one (BONUS - Joint Baltic Sea Research Programme) is to be made later.

- AAL2 – Active and Assisted Living Research and Development Programme – Czech Republic is not involved

- EMPIR European Metrology Programme for Innovation and Research (a long-term scheme for high-quality joint research and development within the metrology community in Europe) – the Czech Metrology Institute.
- EDCTP2 European and Developing Countries Clinical Trials Partnership 2 is devoted to new treatments of conditions related to poverty – Czech Republic is not involved
- Eurostars2 joint programme of EUREKA and the EU focused on international collaboration of SMEs which conduct research and development along with their business activities: Ministry of Education of the Czech Republic

EMPIR

The European Metrology Programme for Innovation and Research was made part of the Horizon 2020 framework programme by the applicable Commission Regulation. The EMPIR programme follows on the successful European Metrology Research Programme (EMRP) under FP7. Like EMRP, EMPIR is managed by EURAMET, the European Association of National Metrology Institutes whose membership comprises metrology institutes from 28 Member Countries. EURAMET focuses on consolidating research activities in the field, preventing their overlaps, and achieving the critical mass for research progress. There is an increased focus within EMPIR on specialized modules concerning industrial research and utilisation, the support of technical standardisation, and creation of essential elements of the metrology infrastructure. On EMPIR and EURAMET, the Czech Republic is represented by the Czech Metrology Institute. Associate members are the Czech Hydrometeorological Institute, the Institute of Photonics and Electronics of the Academy of Sciences of the Czech Republic, and the Research Institute of Geodesy, Topography and Cartography.

Further information can be found at these addresses:
www.msmt.cz/vyzkum-a-vyvoj-2/empir-8b
www.h2020.cz/cs/eit-jrc-horizontalni-aktivity-euratom/souvisejici-iniciativy/clanek-185

EUROSTARS 2

Under this scheme, support is provided according to the rules of EUREKA programmes. Its predecessor, the EUROSTARS programme was officially announced on 2 October 2007. The EUROSTARS2 programme, part of Horizon 2020, began in 2014.

Together with other European Community programmes, it targets small and medium-sized enterprises which pursue research and development alongside their principal activity. This programme supports new projects carried out by international consortia for the benefit of small and medium enterprises collaborating among themselves of with research institutions and large companies. It aims at European SMEs, especially those with high growth potential. The purpose is to generate new market opportunities and activities based on R&D results. The programme supports new products, technologies and services to enable their fast launching.

The EUROSTARS2 programme currently associates 33 Member Countries. The Czech Republic was one of the founder states. The primary contact and information point for the EUROSTARS2 programme is the EUREKA National Programme Coordinator.

Further information can be found at these addresses:
www.eurostars-eureka.eu
www.msmt.cz/vyzkum-a-vyvoj-2/program-eurostars-2-7d

5.2 Horizon Europe 2021-2027

In the 2021–2027 period of the Multiannual Financial Framework of the EU, Horizon Europe will be the fundamental tool for supporting research, development and innovation in the EU and is intended to substantially contribute to stronger cooperation among EU member states within the European Research Area and to international cooperation with associated states which elect to join the framework programme. The Horizon Europe framework programme is complementary to and

synergistic with other EU policies. It also reflects EU's priorities in digitisation and industrial transition (Industry 4.0, Digital Single Market), power generation, low-carbon economy and natural resources (Energy Union) and environment protection, food sustainability, health of the population and security. Horizon Europe is also intended to help Europe contribute to UN's Sustainable Development Goals and to meet its obligations under the Paris Climate Agreement.

EU institutions reached political agreement on Horizon Europe on 11 December 2020 and drafted its budget at EUR 95.5 billion in current prices (including EUR 5.4 billion from NGEU – see section 4.4). Horizon Europe has three fundamental goals:

- to strengthen the EU's scientific and technological bases and the European Research Area (ERA)
- to boost Europe's innovation capacity, competitiveness and jobs
- to deliver on citizens' priorities and sustain European socioeconomic values

The new programme will be governed by two crucial documents. One of them is the Strategic Plan, a basis for work programmes. The purpose of the strategic plan is to identify the focus and priorities in research and innovation support and specify a new concept of missions and European partnerships. The first strategic plan for Horizon Europe (2021-2024) which defines key strategy orientations for research and innovation support was adopted on 15 March 2021.

The strategic plan sets out four strategic orientations for research and innovation investment in Horizon Europe for the next four years:

- Promoting an open strategic autonomy by leading the development of key digital, enabling and emerging technologies, sectors and value chains
- Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources
- Making Europe the first digitally enabled circular, climate-neutral and sustainable economy
- Creating a more resilient, inclusive and democratic European society

International cooperation underpins all four orientations, as it is essential for tackling many global challenges.

The strategic plan also identifies the European co-funded and co-programmed partnerships and the EU missions to be supported though Horizon Europe. The partnerships will cover critical areas such as energy, transport, biodiversity, health, food and circularity, and will complement the ten Institutionalised European Partnerships proposed by the Commission in February. EU missions will address global challenges that affect our daily lives by setting ambitious and inspirational but achievable goals like fighting cancer, adapting to climate change, protecting our oceans, making cities greener and ensuring soil health and food. Employing a large portfolio of instruments across diverse disciplines and policy areas, the EU missions will tackle complex issues through research projects, policy measures or even legislative initiatives.
The plan's orientations also address a number of horizontal issues, such as gender. The integration of the gender dimension will be a requirement by default in research and innovation content across the whole programme, unless it is specified that sex or gender may not be relevant for the topic at stake.

The other document will be Horizon Europe's Implementation Strategy which should provide a unified strategy for implementation across the project life cycle. This document demonstrates the effort of the European Commission to involve the professional public in the debate and to simplify the existing rules. The Implementation Strategy should operate as a set of rules and processes to produce the most effective impact of Horizon Europe. The Strategy aims at transparency, simplified rules and fostering synergies with other European programmes.

It provides a basis for the European Parliament and the Council to enact relevant legislation. The ERC Work Programme (European Research Council) was approved on 22 February 2021. The EIC Work Programme (European Investment Centre) was approved on 17 March and formally launched on 18 March. The main work programme addressing covid-19 variants is to be(was?) approved in March 2021. The complete main work programme is to be adopted in April 2021. The first calls will be launched after each work programme has been adopted.

Funds from Horizon Europe will go toward excellent research in the public sector, commercialization of scientific knowledge and support of breakthrough innovation in the business sector. Emphasis will be placed on knowledge transfer from the research sector to industry to make commercial use of knowledge capital through developing high added-value goods and services. In addition, there will be efforts to ensure that research and innovation activities adequately reflect the socioeconomic needs of European society.

Horizon Europe follow-on Horizon 2020 and brings the following new aspects:

- European Innovation Council – financial support for high-risk breakthrough innovation which can generate new market opportunities.
- New research and innovation goals (missions) across the entire EU – these goals will focus on societal and economic challenges faced by individual countries. Their definitions will be developed with contributions from citizens, stakeholders, member states and the European Parliament.
- Maximizing the innovation potential across the EU.
- Greater openness – the principle of "open science" with open access to data and publications.
- A new generation of European Partnerships and broader interaction with other EU programmes.

Structure of Horizon Europe
The first pillar will again address excellent science, namely European Research Council projects and Marie Skłodowska-Curie Actions (MSCA). Research Infrastructures remain part of this pillar. The second pillar will focus on global challenges and the competitiveness of the European industry (in H2020, the second pillar only dealt with industry and innovation). Besides the Joint Research Centre (JRC), this pillar comprises six broad thematic clusters which address global challenges. The third pillar relates to innovative Europe. This pillar includes the European Innovation Council (EIC) whose Accelerator pilot projects were also part of H2020. It also covers the European Institute of Innovation & Technology (EIT) and European Innovation Ecosystems. In addition to the pillars, other activities are planned along with support for Euratom projects.

5.2.1 - Pillar 1 Excellent science

Excellent research is a prerequisite for development of knowledge-based society and economy of the EU. Ultimately, the competitiveness of European enterprises and the EU as a whole hinges on state-of-the-art research infrastructure which delivers breakthrough findings applicable to innovative products and high-added-value services. The first pillar of Horizon Europe will focus on supporting excellent research, development of human capital, i.e. the careers of researchers in science, and state-of-the-art research infrastructure. The first pillar will be implemented using the bottom-up principle.

- **The European Research Council (EUR 16.6 billion)** was founded to support investigator-driven frontier research.
  The main objective of the ERC is to stimulate scientific excellence by supporting the best, truly creative scientists. Scientists are motivated to push the current boundaries of knowledge and limits of scientific disciplines. The ERC complements other EU funding schemes (established as part of FP7 and continuing under Horizon 2020), such as national research-funding agencies, and is a flagship of the Ideas programme of FP7. The ERC follows the bottom-up approach in selecting its projects, and therefore enables researchers to identify new opportunities and directions in their science disciplines
  The ERC focuses on long-term funding for excellent scientists (from various countries *outside Europe(OK?))* and their research teams who work in or are going to move to Europe. The sole criterion is scientific excellence.

  Horizon Europe is expected to rely on the same financial schemes as the previous framework programme. Eligibility conditions will also remain unchanged (namely ERC

Starting and ERC Consolidator where proof of a PhD degree is required) as will restrictions on re-submission of project applications.
Types of support:

- ERC grants for early-stage researchers
- ERC Consolidator grants
- ERC grants for advanced researchers
- ERC Synergy grants
- Proof of Concept

Generally, participation in ERC projects is seen as an indication of the quality of the research organisation – and even as an indicator of the quality of research at a national level:

- to date, Czech research organisations have been awarded 29 ERC grants but they lag behind the research organisations from EU-15 countries in the number of project proposals recommended for funding
- Czech research organisations submit considerably fewer project proposals than those from EU15 and show a lower success rate
- 26% of the proposals from Czech research organisations and 35% of the projects awarded funding fall under three subject panels
- more than half of the projects which were awarded funding and more than half of the funding from ERC has been won by only three facilities.

- **Marie Skłodowska-Curie Actions (EUR 6.8 billion)** – In Horizon Europe, these actions will focus on promoting excellent research and will encompass all research and innovation disciplines (bottom-up principle). Greater emphasis will be placed on collaboration with the non-academic sector through short-term attachments. International mobility will remain a key aspect. Researchers will not be able to apply for funding in the country in which they have been active in the long term.
  Grant types:
  - networks for doctoral students
  - individual grants for postdoctoral fellows
  - exchange stays
  - COFUND
  - Citizens
- **Research Infrastructures (EUR 2.4 billion)** - The general purpose of research infrastructures in Horizon Europe is to follow on from H2020 and create and disseminate excellent research findings in order to build a European knowledge base. The main goal is to provide the EU with high-quality world-class research infrastructures open to researchers. Additional objectives include reducing the fragmentation of the ERA, avoiding duplicate efforts and improving the coordination among regional, national and European activities and improving the access to digital research resources through the European cloud for open science.

5.2.2. - Pillar 2 Global challenges and competitiveness of European industry

The clusters in the second pillar of Horizon Europe – Global challenges and competitiveness of European industry – will foster systemic changes in society and the economy rather than focus on individual sectors. The clusters will strongly contribute to meeting the objectives of the European Green Deal, the sustainable development goals of the United Nations Organisation and the strategies and policies in industry, digitalisation, biodiversity protection and agriculture. In order to address these complex challenges, a number of different stakeholders must be engaged, including end users and civil society. The clusters will be linked to research missions with clearly-defined goals and impacts and newly-defined European partnerships whose strategic research and innovation agendas will facilitate the coordination of efforts in addressing global challenges and meeting sustainable development goals.

- **Cluster 1 Health-** The main challenge is to address persistent inequality in health among different EU countries and within them. In addition, the increasing incidence of some diseases must be addressed, such as cancer, non-infectious diseases, mental

illnesses and also infectious diseases. Another challenge is to improve popularisation of (*education in*?) disease prevention, including vaccination.

Other important areas of focus include:

- the impact of environmental pollution on human health
- increasing antimicrobial resistance
- demographic changes and population ageing

- **Cluster 2 Culture, Creativity and Inclusive Society** - aims to achieve the goals and address the priorities of the EU in strengthening democratic government and citizen participation
- **Cluster 3 Civil Security for Society** - the protection of citizens, the European economy, public spaces and all types of critical infrastructure from terrorism and crime to providing a safe and secure digital environment. The research will aim at understanding the causes of terrorism and crime in order to set up effective preventive measures and innovate early warning technologies and procedures and provide rapid and effective responses to actual threats. The protection of borders focuses on legal, safe and rapid movement of people and goods. The goal in cybernetic security is to create a trustworthy and secure digital environment using the latest technologies and services.
- **Cluster 4 Digital, industry and space** - Digitalisation and technology development, including space technologies, have a profound impact on every sector of the economy and the whole of society. They are the basis of industrial production transformation and creation of new products and services which have a profound impact on our way of life and are key to future sustainable development. The main strategic priorities include:
  - Transformation of European industry towards a clean, climate-neutral, circular and competitive economy
  - Securing (strengthening) European leadership and strategic autonomy in terms of key technologies
  - Development of technologies and innovation for the benefit of citizens
- **Cluster 5 Climate, Energy and Mobility** - The main objectives of this cluster is to tackle climate change, boost competitiveness in industry, power generation and transport and improve the quality of public service in these sectors. This requires a better understanding of the causes of climate change, its evolution, risks, impacts and opportunities. Energy and transportation systems must be climate and environment-friendly, smarter, safer, more resilient, inclusive, competitive and efficient. The driving force is the need for decarbonisation of the energy and transportation sectors by 2050 and for their improved competitiveness.
- **Cluster 6 Food, Bioeconomy, Natural Resources, Agriculture and Environment** - Research and innovation in this cluster aim to contribute to meeting the goals of key European and global strategies and policies. Among them are the sustainable development goals defined by the United Nations, which include ensuring adequate nutrition, clean water, good health and quality of life for the world's population and emphasis on sustainability of production and consumption. The activities in cluster 6 are to contribute to achieving climate neutrality by 2050 which is the key goal of the European Green Deal.
- **Non-Nuclear actions of the Joint Research Centre** (EUR 2.2 billion) – more information about the JRC is given in section 5.4

Missions - This new concept in Horizon Europe comprises a range of research and innovation actions with a major impact across disciplines and sectors which should be relevant to the majority of the European population. Each mission will aim at ambitious and clearly-defined measurable goals and impacts which are achievable within a set time frame. The focus of each mission is derived from recommendations by experts nominated to mission boards. The missions will be announced as special calls in the second pillar of Horizon Europe. At this point, there are five missions:

- Cancer
- Adaptation to climate change including societal transformation

- Healthy oceans, seas, coastal and inland waters
- Climate-neutral and smart cities
- Soil health and food

European partnerships - Partnerships are not new to framework programmes. However, they have been rationalised and redefined for Horizon Europe to effectively contribute to the goals and the planned impact of the framework programme. By bringing private and public partners together with the EU, European Partnerships will help develop and implement research and innovation activities.

- Co-programmed European Partnerships will be based on a memoranda of understanding and/or agreements between the European Commission and partners from the private or public sector.
- Co-funded European Partnerships will be based on a grant agreement made after open call evaluation between the European Commission and a consortium of partners.
- Institutionalised European Partnerships are research and innovation programmes conducted by several member countries which are based on decisions made by the Council and the European Parliament according to Art. 185 of the Treaty on the Functioning of the European Union or operate as structures established according to Council decision under Art. 187 of the Treaty.

The partnerships will be made for the following areas:

- Health
- Digitalisation, industry and space
- Climate, energy and transport
- Food, bioeconomy, natural resources, agriculture and environment
- EIT cross-sectoral partnerships

5.2.3. – Pillar 3 Innovative Europe

Exploitation of the research potential regarding innovative products and high-added-value services remains a challenge for the European Research Area. The third pillar will focus on knowledge transfer, transfer of human resources from the research to the business sector, development of start-ups, providing access to venture capital for innovators and bringing European financial facilities for innovation support together under a single institution. It aims to help bridge the commercialization valley of death for research results and strengthen innovation processes in the manufacturing sector with emphasis on small and medium-sized enterprises and start-ups (the number of dynamically growing start-ups – unicorns – is almost five times less in Europe than in the USA).

- **European Innovation Council (EUR 10 billion) –** Promotion of potentially breakthrough innovations with scale-up potential. The European Innovation Council is EU's single point of contact for European innovators who include researchers and private companies, namely small and medium-sized enterprises. Its goal is to promote high-risk breakthrough and disruptive innovation (in technology and other fields) with scale-up potential and to bridge gaps in funding by offering a wider range of risk-financing tools. One of the envisaged outcomes is shorter paths for innovative enterprises from the initial concept to market application. EIC support is intended for individual applicants and multidisciplinary consortia. It follows the bottom-up rule, i.e. places only minimal constraints on eligible science and engineering disciplines. Exceptions include special thematic calls promoting innovation with major economic or social impacts.
- **European Innovation Ecosystems (EUR 0.5 billion) -** Innovation links with regional and national participants. European Innovation Ecosystems (EIE) form the second part of the Innovative Europe Pillar. Their main goal is to improve the innovation environment across the EU to ensure it effectively supports researchers as well as innovation entrepreneurs. Therefore, it stimulates collaboration, networking and knowledge exchange among participants who support innovators on local, regional, national and international levels. It covers all types of innovation and all innovators

across the EU: enterprise innovation, social innovation and innovation in the public sector. The activities supported in EIE complement the activities of EIC tools and the European Institute of Innovation & Technology.

- **European Institute of Innovation and Technology – EIT (EUR 3 billion) -** Brings together key players (in research, education and business) to pursue a shared goal: promoting innovation. The EU established the EIT in 2008. The Institute does not provide any project funding. It builds and co-funds a knowledge and innovation community to establish links between universities, research, and business. The EIT helps overcome structural deficiencies in the EU, which are reflected in the poor innovation performance and generation of new products, services and processes. The EIT goals and activities are designed under the Strategic Innovation Agenda (SIA) for seven-year periods. In the 2021–2027 period, EIT will continue to support KICs in order to strengthen innovation ecosystems which help solve global problems in conjunction with other parts of Horizon Europe and other programmes of the EU. By promoting integration of education, research and entrepreneurship and by supporting a new generation of entrepreneurs, EIT together with EIC will create an environment favourable to innovation and stimulate the formation of innovative companies. In this effort, EIT will aim at:
    - Strengthening sustainable innovation ecosystems across Europe
    - Fostering the development of entrepreneurial and innovation skills in a lifelong learning perspective
    - Bringing new solutions to global societal challenges on to the market

5.2.4 - Widening participation and strengthening the European Research Area

The main goal of this horizontal effort is to strengthen collaboration across Europe, namely by opening European research and innovation networks and contributing to enhancing the research management capacities in countries which are eligible for grants for widening participation (i.e. 13 new member states + Portugal, Greece, the 9 outermost regions of the EU and selected third countries associated with Horizon Europe). Furthermore, national policy reforms should be supported not only in research and innovation, and targeted measures should be applied towards full use of the talent pool of the EU. Although the territory of the EU has given the world astonishing achievements in science and technology, its research and innovation efforts remain fragmented. The activities are divided into two areas. The joint financial goal is at least 3.3% of the Horizon Europe budget.

- **Widening participation and spreading excellence, e.g.:**
    - “Teaming” and “Twinning”
    - “EVP Professorship”
    - COST programme
    - Supporting national contact points
    - Brain circulation and excellence initiatives
    - Joining currently running projects

- **Reforming and enhancing the European Research and Innovation system**
    - Scientific evidence and forecasting
    - Open science
    - Policy support tool
    - Attractive careers in research
    - Scientific activities of citizens, responsible research and innovation
    - Gender equality

5.2.5 - EURATOM Research and Training Programme 2021–2025

The Euratom programme is both complementary to and an integral part of Horizon Europe. It was established by another agreement. Therefore, its basic duration is five years, from 2021 to 2025. It may subsequently be extended by two years, to 2027. Fundamental legal regulations will enable synergies with Horizon Europe to be leveraged. The Euratom programme relies on the same project evaluation rules for independent reviewers. The requirements for the dissemination of results and their

maximised use is the same as well. The same tools are used, such as the Funding and Public Tender Portal. The rules of participation are also identical. The goal is to facilitate research and professional training in mitigating risks in nuclear safety and security, developing safe nuclear technologies and optimal radiation protection. Key new aspects:

- Stronger focus on applications other than power generation (medicine, industry, space)
- Opening opportunities for nuclear researcher mobility through Marie Skłodowska - Curie Actions.
- Simplification: special objectives were reduced from the previous 14 to 4 and now include direct actions (by JRC) as well as indirect ones.

5.2.6 InvestEU for research and innovation

InvestEU provides the European Union with crucial long-term funding to attract private investment to support sustainable recovery and help increase the resilience of the European economy which will lay more emphasis on environmental aspects and digitalisation.

Four policy thrusts:

- sustainable infrastructure
- research, innovation and digitalisation
- small and medium enterprises
- social investment and skills

The EU budget guarantee of EUR 26.2 billion is allocated to the four thrusts approximately as follows:

- sustainable infrastructure: EUR 9.9 billion
- research: innovation and digitalisation: EUR 6.6 billion
- small and medium enterprises: EUR 6.9 billion
- social investment and skills: EUR 2.8 billion

Strategic investment will be available for all four thrusts in order to meet the future needs of the European economy and promote open strategic autonomy of the EU in key sectors.

5.2.7 Further information on the programme

Brochures:
https://www.h2020.cz/files/brozura-Horizont-Evropa-H2020-BCE-final-web-NOVE_2.pdf

https://ec.europa.eu/info/sites/info/files/research_and_innovation/strategy_on_research_and_innovation/presentations/horizon_europe_cs_investice_utvarejici_nasi_budoucnost.pdf

Programme website:
https://ec.europa.eu/info/horizon-europe

https://www.horizontevropa.cz/cs

Calls for proposals:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home

https://www.horizontevropa.cz/cs/vyzvy

5.3 European Research Area (ERA)

The European Research Area (ERA) was established by the European Council to create a unified European environment for research and development, to improve cohesion in this area, and to improve European competitiveness with the United States and certain Asian countries. It was a response to the steadily decreasing spending on European research and development, namely private investment in research, the low attractiveness of careers in science or research, the declining or inadequate share of women in research, the insufficient use of research resources for the benefit of society, and the low mobility of European research workers. An added factor was the absence of coordinated support of large research infrastructures, which contribute to excellence of science in Europe, and recurrent problems related to science ethics (e.g. stem cell research). The European Research Area was a step towards tackling these issues.

In 2011, the Ministry of Education of the Czech Republic saw major changes in the way international cooperation in R&D was managed and the way the country participated in the European Research Area. The Department of International Cooperation in R&D was established with responsibility for the Czech Republic's membership in the ERA (including participation in and evaluation of framework programmes). In addition, the Department of Funding Research and Development Projects was formed to oversee the implementation of bilateral and multilateral R&D international cooperation agreements, and the funding of the applicable cooperation programmes. Since 2013, the Research and Development Department and the Department of Support of Higher Education Institutions and Research of the Ministry have been operating. They are responsible for international cooperation, funding, and participation of the Czech Republic in the ERA.

The ERA includes EU Framework Programmes, national policies and research programmes of EU Member States, and their coordination, as well the operation of European research organisations and their infrastructure. Framework programmes are therefore designed and launched with the objective to promote the formation and structuring of the ERA. The aim is to improve quality of life in the EU and Europe through efficient use of investment in R&D (public and private investment, and private/public partnerships – PPP), improved performance of research and development, and better research infrastructure.

Information on and documents concerning the European Research Area can be found on the European Research portal https://www.evropskyvyzkum.cz/cs/cr-a-era

5.3.1 ERA-NET PLUS

The ERA-NET and ERA-NET PLUS programmes are jointly implemented by participating countries with contributions from the EU, e.g. through harmonized work programmes, joint or coordinated calls for proposals, joint evaluation procedures and joint implementation of projects. The purpose of projects of the ERA-NET-type is to link national and regional research programmes to bring them closer, and to develop and pursue joint activities. The ERA-NET scheme was launched already as part of the 6th Framework Programme (FP) as one of the tools strengthening the coordination of national and regional research policies in the EU. In the 7th Framework Programme, the scheme continued successfully, both in the form of new ERA-NET activities, the existing ones that started in the 6th FP and as their upgraded versions on the ERA-NET Plus level. The ERA-NET scheme is now one of the tools of the Horizon 2020 programme.

The ERA-NET Plus scheme started under FP7 as a support tool for selected projects which receive an additional bonus from the European Commission to announce joint calls. ERA-NET Plus supports initiatives that deepen the collaboration in given fields through joint research programmes, and enables them to translate into initiatives within the definition of Article 185 of the Treaty on the Functioning of the European Union. As in ERA-NET projects, the eligible participants of ERA-NET Plus projects are only programme managers and programme owners. However, under this scheme, they must have already created their own research programme.

The Ministry of Education will support the participation of Czech organisations in ERA-NET Cofund partnerships (in alignment with other specific-purpose funding providers as eligible participants in these partnerships) but the emphasis in terms of budget will be laid on the Czech participation in Art. 185 and 187 TFEU initiatives and Joint Programming Initiatives, as those have the greatest degree of integration and coordination in the sphere of R&D programmes funding in the EU.

5.3.2 QUANTERA

QuantERA: ERA-NET Cofund in Quantum Technologies is a network of 32 agencies from 26 countries coordinated by the National Science Centre in Poland. It aims to support European research consortia involved in long-term research into quantum technologies under the ERA-NET Cofund system of the European Union. Quantum technologies have become a new and rapidly developing area of research which opens up radically new modes of quantum information processing and communication. They promise to give rise to new approaches in many fields of science and technologies by using specific quantum effects. QuantERA is supported by the European Union in the scope of FET (Future and Emerging Technologies), whose mission is to exploit the potential of an excellent European research base to gain a technological head start thanks to technological breakthroughs. QuantERA aims to unlock the widely-recognized industrial potential of quantum technologies to meet current societal needs and deliver benefits for the general public.

As with other EU-level tools, the main goal of QuantERA: ERA-NET Cofund in Quantum Technologies is to strengthen international cooperation, define a Europe-wide approach and initiate transnational co-funding of quantum technology research. Furthermore, the network strives to support international research projects co-funded by the European Commission, boost European research, develop reliable technologies, identify new opportunities and strengthen Europe's competitive advantage and its leading position in the field. In addition, it aims to support various research facilities which can demonstrate capabilities in the most demanding novel areas of research.

QuantERA: ERA-NET Cofund in Quantum Technologies is one of the initiatives which promote excellent research in the European Research Area. In November, the European Commission issued the communication "QuantERA ERA-NET Cofund in Quantum Technologies" with detailed information on quantum technology projects (i.e. the objectives, coordinator, the countries involved and other relevant information). Countries can get involved on the basis of their preferences and capacities.

Further information can be found at this address:
http://www.msmt.cz/vyzkum-a-vyvoj-2/quantera-1

5.3.3 E-RARE

The Ministry of Education of the Czech Republic takes part in the joint transnational call on rare diseases under ERA-Net Cofund (E-Rare-3: 2014-2019), which was launched by the E-Rare consortium in 2017. A rare disease, according to the EU definition, is one which affects fewer than 5 in 10,000 people. The Czech Association for Rare Diseases estimates that there are between 600 thousand and 800 thousand rare disease patients in the Czech Republic, whereas the number for the European Union is more than 30 million.

There are over 8,000 rare diseases and new ones continue to be discovered. Special health care is required to fight rare diseases. It is strategically desirable for healthcare policies to support this concept because knowledge sharing between research teams in Europe can provide rare disease patients with access to high-quality healthcare. The main purpose of the E-Rare initiative is to plan and publish transnational calls for this research field on a regular basis.

Further information can be found at these addresses:
http://www.msmt.cz/vyzkum-a-vyvoj-2/era-net-e-rare

http://www.erare.eu/

5.4 Joint Research Centre (JRC)

The JRC is a Directorate-General of the European Commission under the responsibility the Commissioner for Education, Culture, Youth and Sport. It consists of seven research institutions based in five Member States: Belgium, Germany, Italy, Netherlands and Spain.

The Joint Research Centre was established in 1957 to disseminate European expertise in nuclear energy. Over time, it has become an extensive, diverse and multifunctional research institute integrated into the European Commission. It is at the frontier between technology research and real-world applications of this research in Community policies. As part of preparation of FP7, new rules were developed for JRC activities. JRC pursues basic research and supports EU policies with scientific and technical consultancy. In close cooperation with the EU's Directorate-Generals, the JRC addresses major societal issues by stimulating innovation, advancing new methods, tools and standards, and sharing know-how with Member States, the scientific community and international partners. The Joint Research Centre can take part as a partner in calls for proposals for implementing its policies under Horizon 2020. Non-nuclear direct actions of the Joint Research Centre are supported with EUR 1,903 million, which equals 2.47% of the budget of Horizon 2020.

Further information can be found at this address:
https://www.evropskyvyzkum.cz/cs/nastroje-spoluprace/iniciativy-ek/jrc

5.5 Related international initiatives

5.5.1 P2Ps and Cofund

Under Horizon 2020, partnerships within the public sector (Public-Public Partnerships, P2Ps) are assisted through a new tool, the programme cofund action. The rules for participation and dissemination in Horizon 2020 define this as an action funded through a grant, the main purpose of which is supplementing individual calls or programmes funded by entities other than Union funding bodies. A programme cofund action may also include complementary activities of networking and coordination between programmes in different countries. Cofund activities are implemented HEU as well.

Further information can be found at this address:
www.era-learn.eu
https://www.h2020.cz/cs/eit-jrc-horizontalni-aktivity-euratom/souvisejici-iniciativy/eranet

5.5.2 Contractual Public-Private Partnerships (PPP)

PPP is a form of cooperation between public institutions and the private sector aimed at modernizing the provision of strategic public services.

Together with Joint Technology Initiatives (JTIs), the contractual public-private partnerships foster cooperation between the public sector, research, and the business sector for the benefit of research, development and innovation. Eight cPPPs were launched by the European Commission on 17 December 2013, and a ninth one on 13 October 2014. Their areas are of strategic importance to European industry. Unlike JTIs, the cPPPs do not announce their own calls. Instead, the funding is awarded via the calls under Horizon 2020. This mechanism continues as InvestEU.

Further information can be found at these addresses:
www.europa.eu/rapid/press-release_MEMO-13-1159_en.htm
https://www.h2020.cz/cs/eit-jrc-horizontalni-aktivity-euratom/souvisejici-iniciativy/ppp

5.5.3 Joint Technology Initiative

Joint Technology Initiatives are one of the forms of public/private partnerships (PPPs) launched early in FP7 with strong support from the European Commission and European industry, known as institutional PPPs. They built on several industry-relevant European Technology Platforms and were the first example of industry, the research community and public authorities jointly funding ambitious

common research objectives on a European scale. Joint undertakings were set up to achieve the objectives of JTIs in accordance with article 187 of the Treaty on the Functioning of the European Union (ex Article 171 of the TEC).
The JTIs continue under Horizon 2020 and bring together the needs and resources of the European Union and industry. They set out commitments, including financial commitments, over a seven-year period from both the EU and from the industry partners. They each have clear objectives and establish their own strategic research and innovation agendas, on the basis of which they fund projects evaluated and selected through calls for project proposals.

More information and all JTIs can be found at:
www.h2020.cz/cs/eit-jrc-horizontalni-aktivity-euratom/souvisejici-iniciativy/jtis

Joint Technology Initiative EuroHPC

The Czech Republic joined EuroHPC on 24 January 2018 by signing the Declaration on Development of Cooperation on High-Performance Computing (HPC). The EuroHPC initiative stems from the Declaration on Cooperation on HPC which was signed on 23 March 2017 in Rome. The initiative aims to develop two pre-exascale and two exascale supercomputer systems in Europe to boost the continent's global competitiveness in HPC technology. EuroHPC will be implemented via joint undertakings established under Article 187 of the Treaty on the Functioning of the European Union. Its articles of association have been debated by the programme preparation bodies of the EU Council for Competitiveness which brings together government ministers responsible for research. The joint undertaking for EuroHPC is intended to combine the fragmented streams of public funding for HPC development provided across the multiple implementation schemes of Horizon 2020. The goal of the initiative is to place Europe among the top three leaders in the development of HPC technologies in the next decade. The strategic objective of the initiative is to improve the ability of European businesses to develop world-class supercomputing equipment to make the European HPC infrastructure independent of non-European suppliers.

Further information can be found at:
https://eurohpc-ju.europa.eu/

ECSEL Joint Technology Initiative

The ECSEL JTI (Electronic Components and Systems for European Leadership) is an integral part of the Horizon 2020 (2014–2020) framework programme and is carried out by a Brussels-based joint undertaking bearing the ECSEL name. The ECSEL joint undertaking was established according to the applicable Council regulation. Its members include the EU, represented by the European Commission, and the Member States which have joined the undertaking. It supports research, development and innovation of embedded computing systems, microelectronics and intelligent systems through annual calls for project proposals.

Further information can be found at:
www.msmt.cz/vyzkum-a-vyvoj-2/ecsel

5.5.4 European Technology Platforms

European Technology Platforms (ETPs) bring together key actors (industrial companies, trade associations and unions, higher education institutions and other research organisations, financial institutions, public administration bodies and user and consumer associations) in technology fields of strategic importance. Their purpose is to define and realize visions for medium-term and long-term research, development and innovation (Strategic Research and Innovation Agenda). ETPs should mobilize the research and innovation capacities of their members and other partners, and strengthen the position of their fields on both European and global markets by implementing their strategic research agenda. European Technology Platforms play a role in the functioning of the European Commission as well, as part of the external advice and societal engagement needed to implement Horizon 2020. ETP members establish consortia and develop project proposals to be submitted to

framework programmes, which is why active participation is crucial for the relevant Czech institutions and organisations.

Further information can be found at this address:
https://ec.europa.eu/research/innovation-union/index.cfm?pg=etp

5.5.5 European Innovation Partnerships

European Innovation Partnerships (EIPs) are a new approach to research and innovation identified by the EU in one of the flagship initiatives of the Europe 2020 strategy – the Innovation Union. EIPs are not a new programme or tool but joint platforms for partnership and cooperation, focusing on key tasks in areas which are crucial to the economic growth of Europe. Their primary objectives are to define joint tasks, coordinate activities across sectors and policies, link European and national levels, strengthen private/public sector collaboration, eliminate persistent hurdles from innovation and research processes, and accelerate the uptake of innovative ideas by the market. EIPs streamline, coordinate, encompass and complement existing tools and initiatives, wherever relevant. Funding for EIPs is provided from public resources, typically through grants from running programmes at European, national or regional levels. The private sector contributes to these partnerships as well. An important aspect of EIPs is the coordination between member states to prevent duplicating efforts and facilitate effective use of funds. In essence, EIPs are a coordination rather than a financial facility, as they do not provide new funding for research and innovation activities. The EU framework programme for research and innovation Horizon 2020 (2014–2020) comprises the following EIPs. The partnership will continue as one of the fundamental elements in HEU:

EIP on Active & Healthy Ageing
EIP on Active & Healthy Ageing ("EIP on AHA") focuses on Europe's one of the most pressing societal challenges: the ageing of its population. It links various activities related to healthy and active ageing and independent living of EU citizens, development and production of relevant products and efforts that aim to improve the efficiency and sustainability of social and healthcare systems. An important aspect is strengthening the competitiveness of European industry through business and expansion to new markets.

EIP on Agricultural Sustainability and Productivity
EIP on Agricultural Sustainability and Productivity ("EIP-AGRI") strives to make European agricultural and forestry sectors competitive and sustainable. Its goal is to secure stable supply of foodstuffs, animal fodder and existing and new biomaterials. It also focuses on sustainable and environmentally sound management of basic natural resources for crop growing. To meet its goals EIP-AGRI strengthens the links between the research and production sectors (farmers, food processing plants, consultancy and non-profit organisations).

EIP on Smart Cities and Communities
The aim of EIP on Smart Cities and Communities ("EIP-SCC") is to provide innovative answers to environmental, societal and health challenges faced by today's cities. It relies on the interaction between information and communication technologies, advanced transport management and environmentally-sound energy management. EIP-SCC strives to remove barriers to the creation of "smart cities", facilitate co-funding of pilots and coordinate existing initiatives by promoting sharing of funding resources.

EIP on Water
EIP on Water supports innovative solutions to major European and global water management challenges. It also strives to market the resulting innovation within and outside the EU. To this end, the partnership initiates and stimulates collaboration between public and private sectors, non-government organisations and the general public. It establishes new action and working groups to achieve its purposes.

EIP on Raw Materials
EIP on Raw Materials reflects two flagship initiatives of the European Commission: "Innovation Union" and "Resource Efficient Europe". Its aim is to help raise industry's contribution to the EU GDP to

around 20% by 2020. As part of this ambition, it should also lead to reduced Europe's dependence on raw material imports, stimulate European production and exports, make Europe one of the leading players in raw materials worldwide, and reduce the impacts on the environment and society.

Further information can be found at this address:
https://www.evropskyvyzkum.cz/cs/nastroje-spoluprace/iniciativy-ek/eip
https://ec.europa.eu/research/innovation-union/index.cfm?pg=eip

5.5.6 Joint Programming

Joint Programming is based on voluntary partnership between EU member states and associated countries and aims to define and carry out joint strategic research and development to address the grand societal challenges. As with other EU-wide tools, the purpose of Joint Programming is to coordinate existing national research and development programmes or establish new ones for all participating countries to share knowledge and experience and effectively coordinate the use of national aid. Selection of optimal tools and monitoring, implementation and evaluation of research programmes take place at the joint level as well.

As one of the initiatives that bring to life the European Research Area, Joint Programming involves both basic and applied research and development. It takes place under 10 initiatives which are open to all EU member states based on their preferences. Primarily, Joint Programming should lead to coordination of existing research budget funds allocated by EU member states to grand societal challenges. It may also involve establishment of new international R&D programmes to integrate the budget funds of EU member states. The underlying motive of Joint Programming is to prevent duplication and/or fragmentation of the efforts of EU member states and their research organisations in addressing the grand societal challenges.

The Czech Republic acts a member or observer in five initiatives of Joint Programming:

- Neurodegenerative Disease Research
- Agriculture, Food Security and Climate Change
- A Healthy Diet for a Healthy Life
- Cultural Heritage
- Antimicrobial Resistance

Further information can be found at this address:
http://www.msmt.cz/vyzkum-a-vyvoj-2/spolecne-programovani-1-1

5.5.7 EAFIP - European Assistance For Innovation Procurement

European Assistance for Innovation Procurement provides support for public procurers in innovation procurement (PCP/PPI).

EAFIP focuses on providing support for innovation procurement and training and assistance to public procurers across all EU Member States in the preparation and implementation of innovation procurements of ICT based solutions. It aims to promote benefits and good practices in innovation procurement around Europe in order to promote innovative solutions in public procurement.

Further information can be found at this address:
http://eafip.eu/about/

5.6 European Programme for the Competitiveness of Enterprises and SMEs (COSME)

This multi-year programme of Competitiveness of Enterprises and Small and Medium-Sized Enterprises 2014–2020 is a European Community scheme. Its focus areas include: simpler access to financing for small and medium-sized enterprises, easier creation and development of enterprises, business education in Europe, strengthening the competitiveness of European companies in the long term, and supporting the internationalisation of small and medium-sized enterprises and their access to foreign markets. COSME complements both Horizon 2020 and the Cohesion Policy of the EU,

where the latter is supported from the Structural Funds under national Operational Programmes in Member States. For the period of 2014-2020, CZK 2.5 billion was allocated.

This programme is soon expected to be followed by Single Market Programme which will also provide support for small and medium-sized enterprises.

More information about the programmes, including contacts, can be found at the following addresses:
https://www.mpo.cz/cz/podnikani/dotace-a-podpora-podnikani/programy-eu-na-podporu-msp/cosme/program-pro-konkurenceschopnost-podniku-a-malych-a-strednich-podniku-2014-2020-cosme--146656/
https://ec.europa.eu/cip/index_en.htm
https://www.enterprise-europe-network.cz/
https://ec.europa.eu/growth/smes/cosme_cs

5.7 The Research Fund for Coal and Steel – RFCS

When the Czech Republic joined the European Union, it also became a member of what used to be the European Coal and Steel Community. The revenues generated from the assets of the European Coal and Steel Community (established by the 1952 Treaty for a period of 50 years, which expired on 23 July 2002) were gradually transferred to the European Union and are used to support activities under the RFCS research programme. The administrator of the Czech membership is the Ministry of Industry and Trade and the co-administrator is the Ministry of Education. The Research Fund for Coal and Steel funds projects conducted by all types of undertakings, as well as research organisations. Grants are awarded for research, pilot and demonstration projects outside the EU Framework Programmes.

The main objective of the programme is to support competitiveness of the coal and steel-related sectors. Its priorities in the coal section include strengthening the EU's competitive position, the health and safety in mines, and better use of coal as a clean source of energy. A total of 12 Coal and Steel Technical Groups have been formed to monitor and evaluate projects; three of them focus on coal. The European Commission administers the remaining assets of the European Coal and Steel Community and uses the annual interest to fund RFCS research projects. This amounts to approximately EUR 55 million a year.

The Research Fund co-finances successful project proposals from its budget in the following proportions: 27.8 % for coal and 78.2 % for steel. The RFCS co-funding potential in coal-related projects is not fully used by the organisations in the Czech Republic.

Applicants for funding are mostly SMEs, undertakings, and research institutes. They may come from the former ECSC countries (European Coal and Steel Community), from candidate countries, or even from third countries, on condition that they meet the programme objectives. The applicants' activities need not be directly related to coal and steel, but their research and technical development plans must be in accord with the programme.

The programme supports research work that leads to streamlined production, provided that the equipment to be installed as part of the effort is adequately sophisticated.

For research projects, the maximum financial contribution is 60% of the eligible costs. For pilot and demonstration projects, it is 40%, and for accompanying measures and preparation activities it is 100% of the eligible costs. The public grant may only be used for the purpose and activities specified in the contract, and only to cover the necessary costs related to the project. The programme's typical annual budget is about € 53 million. The call for proposals is continuous, with an annual deadline on 15 September.

The conformity of each proposal's objectives with the interests of the EU is examined. The preferred proposals are those characterized by coordinated interaction, complementarity, and synergies

between various research programmes, and by information exchange between projects funded from this programme, FP7, and Horizon 2020.

More information about the programme, including contacts, can be found at the following addresses:
https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/research-fund-coal-and-steel-rfcs_en
https://ec.europa.eu/info/research-and-innovation/research-area/industrial-research-and-innovation_en

5.8 Copernicus

Copernicus (formerly GMES) is a European programme for monitoring the environment and security situation in order to deliver early and accurate information for decision-making. It represents the Europe's own capacity for monitoring the Earth, and is considered the European contribution to the GEOSS system. It provides its users with free, full and open access to data and information. Its initial stage in 2011–2013 involved the preparation of the programme's data policy. In 2014, Copernicus became fully operational.

Copernicus and its service components are coordinated by the European Commission. Its Space Component is the joint responsibility of the European Space Agency (ESA) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT). The In Situ Component is coordinated by the European Environment Agency. Separate Copernicus services are delivered by authorized European institutions in cooperation with the European Commission.

In 2014–2020, public tenders, mainly for construction of infrastructure, are announced by the European Commission and the European Space Agency. Applicable conditions are set out in each case in the call for tenders. Small-scale projects can receive additional funding from Horizon 2020 as part of the Industrial Leadership – Space section (for data utilisation, COPERNICUS applications, and other topics). Eligible applicants include entities from EU Member States (in public tenders announced by the European Commission), and ESA Member States (in public tenders announced by the ESA). The participation in Horizon 2020 projects is governed by the rules of this programme. The COPERNICUS programme was approved for the 2014–2020 period with a budget of €4.3 billion.

More information about the programme, including contacts, can be found at the following addresses:
http://copernicus.gov.cz/
https://www.copernicus.eu/en

6. INTERNATIONAL COOPERATION

In the Czech government, the department responsible for international cooperation in research and development is the Ministry of Education. International cooperation in research and development follows a long-term strategy. Its basis and the key part are joint research and development projects and participation in international multilateral projects or activities. Some bilateral cooperation agreements are limited to researcher mobility. Details of such arrangements are described below with reference to individual countries.
In the Czech Republic, the legal framework for bilateral cooperation in R&D comprises three types of agreements: those on cooperation in science and technology, the cultural agreements, and the agreements on economic, industrial and science and technology cooperation. The first are negotiated by the Ministry of Education. The second are the joint responsibility of the Ministry of Education, the Ministry of Culture, and the Ministry of Foreign Affairs. The last-named agreements are prepared by the Ministry of Education, and the Ministry of Industry and Trade.

6.1 INTER-EXCELLENCE Programme

Previous aid programmes are now integrated into an umbrella programme entitled INTER-EXCELLENCE.

The programme stimulates international collaboration in R&D and participation of Czech entities in European and global research networks. It aims to promote the participation of Czech facilities in European collaborative projects and the cooperation with non-EU countries. For Czech research teams, it should facilitate access to international knowledge, findings and skills.

It supersedes multiple programmes of international collaboration in R&D administered by the Ministry of Education of the Czech Republic (COST CZ, EUPRO II, EUREKA CZ, INGO II, CONTACT II and GESHER / MOST) which ended in the 2016–2017 period. The new INTER-EXCELLENCE programme seamlessly followed on from these projects and provides financial aid for the period from 2016 to 2024.

It comprises six interactive sub-programmes grouped into three logical units aimed at fulfilling three complementary and interrelated objectives.

- Objective 1: Advancement of international bilateral and multilateral collaboration in research and development
- Objective 2: Provision of services for participation of the Czech Republic in the ERA and other multilateral activities through indirect support for research and development
- Objective 3: Engagement of Czech entities in applied research under the EUREKA international programme

The sub-programmes INTER-A(CTION), INTER-C(OST) and INTER-T(RANSFER) associated with OBJECTIVE 1, which replace the programmes CONTACT II, GESHER/MOST, COST CZ and the sub-programme INFRA of the programme INGO II, are intended to help Czech research facilities join international projects carried out by foreign centres of excellence, engage in the European programme COST, and develop their collaboration with EU member and non-member states on the basis of bilateral intergovernmental or interdepartmental agreements.
The sub-programmes INTER-I(NFORM) and INTER-V(ECTOR) associated with OBJECTIVE 2, which supersede the EUPRO II programme and the POPLATEK sub-programme of INGO II programme, promote the accessibility of strategic information, and other activities related to the integration of Czech research organisations into international research and development initiatives or organisations.
The sub-programme INTER-E(UREKA) associated with OBJECTIVE 3, which supersedes EUREKA CZ, helps those Czech enterprises which engage in research and development to join the international EUREKA programme, supports the links between Czech research facilities and international entities, and thus promotes the production of high-quality R&D results with industrial and service potential.
The purpose of the programme is to advance and strengthen Czech research and development efforts via international collaboration, achieve synergies through combination with other aid mechanisms,

leverage the supported activities and establish effective links with the international research community.
The programme is a tool for strategic focusing of international collaboration aid. It stimulates international collaboration in R&D and participation of Czech entities in European and worldwide research networks. It aims to promote the participation of Czech facilities in European collaborative projects and the cooperation with non-EU countries. For Czech research teams, it should facilitate access to international knowledge, findings and skills. By laying emphasis on strengthening international collaboration, the programme will help improve the quality of research and development output and establish effective links between the research in priority areas in the Czech Republic and the international activities.

The programme period is 2016–2024 and its projects should be no longer than five years. Over this period, the funding provider will launch several public tenders for research, development and innovation (PTRDI) under individual sub-programmes or their combinations. In addition, some projects may be chosen for funding by international bodies.

State budget expenditure by sub-programmes and years (mil. CZK)

	ACTION	COST	TRANSFER	INFORM	VECTOR	EUREKA	Total
2017	96	43	34	26	2	39	240
2018	200	94	84	57	6	84	525
2019	301	141	127	86	8	127	790
2020	355	166	150	101	9	149	930
2021	355	166	150	101	9	149	930
2022	301	141	127	86	8	127	790
2023	200	94	84	57	5	85	525
2024	92	45	44	26	3	40	250
Total	1,900	890	800	540	50	800	4,980

The programme involves consecutive public tenders (PTRDI), normally in the 1st or 2nd (or 3rd if needed) quarter of the calendar year. Their results will normally be announced and contracts with aid beneficiaries will be entered into during the 4th quarter of the same year. The aid will be released in the 1st quarter of the next calendar year. This does not apply to PTRDIs under INTER-A(CTION) whose times will depend on agreements with partner countries. The aid has the form of specific-purpose grants.

According to budget rules, these grants must be used for the specified purpose in the calendar year in which they were awarded. The schedule therefore complies with current budget rules. At least one PTRDI is announced in each sub-programme every year. (INTER-E(UREKA) is an exception where projects are selected by international bodies and no public tenders are announced.) Up to four PTRDIs may take place under INTER-A(CTION) and up to two public tenders in all other sub-programmes (except INTER-E(UREKA)). Across the entire programme, the funding provider may therefore carry out up to 12 public tenders for research, development and innovation, which makes 72 PTRDIs over the whole programme period.

Maximum amounts of aid in individual research and development categories and sub-programmes

	ACTION	COST	EUREKA	TRANSFER
Basic research	100%	100%		100%
Industrial research – research organisation	100%	100%	50%	
Industrial research – undertaking	50%	50%	50%	
Experimental development – research organisation	100%	100%	25%	
Experimental development – undertaking	25%	25%	25%	

You can find more information at: www.msmt.cz/vyzkum-a-vyvoj-2/inter-excellence

6.1.1 INTER-(A)CTION sub-programme

Successor to CONTACT II and GESHER/BRIDGE programmes
The programme supports the collaboration between Czech research facilities and their partner sites in relevant countries with which an agreement or another implementation document, such bilateral intergovernmental or interdepartmental agreement for research and development has been made. The list of these countries valid on the date of the announcement of the PTRDI applies.
The Czech Republic has entered into bilateral intergovernmental or interdepartmental agreements for collaboration in research and development with several prominent non-EU countries. Without direct support, such bilateral collaboration would be no more than an empty proclamation, which would hamper the advancement of research and development as well as the bilateral relations. The motivation is to exploit the potential for collaboration with natural partners of the Czech Republic, i.e. those countries within and outside the EU with certain links to the Czech Republic's location, cultural background and traditions.

Similar financially-based aid mechanisms for joint projects of international cooperation in research and development can also be found in neighbouring states. The need for such schemes arose with the evolution of the ERA (European Research Area) and internationalisation of research and development involving third countries (outside the ERA). In such cases, bilateral cooperation is built on international agreements (much like in the Czech Republic). Funding providers from each country typically reimburse only the costs of entities which are based in their country. They coordinate the public tenders in order to prevent difficulties which the aid beneficiaries might face when allocating and coordinating their research activities under the joint project. Some aid mechanisms involve direct funding for registered joint projects, others require the participants to apply for aid with national agencies which provide funding for research and development. In some schemes, state-owned or public research organisations cover the costs of joint research with foreign partners from the funding provided by their home state as institutional funding (i.e. from their own operational funding). Typically, in those schemes, no additional grants are obtained from central resources for such projects (specific-purpose funding).

Good examples of aid programmes for bilateral or multilateral international cooperation with third countries which may serve as models for creating an analogous scheme in the Czech Republic are those in the Swiss Confederation or those administered by the Danish Council for Strategic Research.

The bilateral programmes of the Swiss Confederation focus on supporting and strengthening scientific cooperation with Brazil, China, India, Russia, the South African Republic and South Korea. Typical projects under those programmes last three years. The grants cover procurement of equipment and operating costs arising from research activities, including salaries. Most public tenders aim at research themes which are seen as priorities by both countries.

The Danish Council for Strategic Research has entered into bilateral agreements for support of science and research in selected disciplines with China, Brazil, India and South Korea.

From the viewpoint of the Czech Republic, balanced support across all partner states is important because aid must be provided to projects from all countries where an agreement for collaboration in research and development was activated by either party.

INTER-A(CTION) is expected to improve the competitiveness of Czech research facilities by strengthening international collaboration, mainly with countries outside the EU.

Applicant entities may include small, medium or large enterprises based in the Czech Republic engaged in research.

6.1.2 INTER-(C)OST sub-programme

The sub-programme supports the participation of Czech research teams in the COST multilateral European collaboration platform in the field of basic or applied research. It may involve new actions

(themes selected for aid by COST bodies) proposed by Czech teams, or joining existing actions (themes) proposed by other research teams.
The Czech research and development continues to be very isolated. Every opportunity should therefore be used to connect it with the international community and developments. INTER-C(OST) directly follows on from the international programme COST.

COST offers a platform for interaction and exchange of information between scientists from COST member countries and cooperating states. INTER-C(OST) supports projects arising from the COST programme.

Methods of funding national COST projects differ in member countries (which need not be EU members). The participants may submit their applications to national funding providers (in the UK it is the Engineering and Physical Sciences Research Council; in Turkey it is the Scientific and Technological Research Council of Turkey). The amounts of aid vary as well, depending on the budget and priorities of the particular COST programme (up to CZK 4.2m (converted amount) per project in Turkey and CZK 4.6m in Switzerland). The Benelux Union, Scandinavian countries, Germany and Israel maintain a joint science fund which supports both national and international activities.

Schemes that combine the international support of networking activities and national support in the form of funding for research and development initiated by personal contact and exchange of information deliver effective synergies. The COST international programme is expected to help gradually break Czech research and development from its isolation and broaden international cooperation through contacts with notable European research facilities. The INTER-C(OST) sub-programme is expected to support the participation of Czech researchers and facilities in international projects and programmes, such as the H2020.

Participation in COST is a prerequisite for taking part in this sub-programme.

Applicant entities may include research organisations and small and medium enterprises based in the Czech Republic that are engaged in research..

6.1.3 INTER-(T)RANSFER sub-programme

This sub-programme's objective is to support the participation of Czech scientists in international research and development projects. To this end, the sub-programme facilitates Czech scientists' membership in leading international research teams or in projects based in foreign research centres, international organisations and government institutions. This includes cases where applicants are eligible to become members, as well as cases where participation has not yet been enabled by the membership of and membership fees paid by the Czech Republic.

Highly-specialized centres of excellence exist and continue to be established to offer unique and expensive cutting-edge instruments, which are typically funded via contributions from member countries/founding members. The centres attract scientists from across the globe who build international research teams which in turn make these exclusive centres even stronger and more exceptional.

The Czech Republic pays membership fees in the form of contributions towards sustainability of some international organisations/government institutions which run centres of excellence. These fees are a precondition for the participation of Czech scientists.

This kind of potential must not be wasted. The access of Czech researchers to these outstanding facilities (in terms of both equipment and human resources) must be supported in cases where applicants are eligible to become members, as well as in cases where participation has not yet been enabled by the membership of them and membership fees paid by the Czech Republic.

The expected outcomes of INTER-T(RANSFER) include the professional growth and development of Czech scientists through gathering international experience, and increased research output in the form of scientific knowledge and measurable results.

INTER-T(RANSFER) delivers synergies mainly with INTER-V(ECTOR).

The applicant entity must be a research organisation.

6.1.4 The INTER-(I)NFORM sub-programme

The sub-programme supports the creation and sustainability of information networks and services in research and development in order to expand the participation of Czech research facilities in international research and development programmes.

In terms of the use of funds from framework programmes, the Czech Republic is one of the less successful EU countries. The level of internationalisation of research at both national and institutional levels is insufficient. In order to change this, the existing information transfer infrastructure must be mobilised and broader service support must be provided to Czech entities to facilitate their engagement in the activities of international research teams and international cooperation in general.

The sub-programme will help disseminate information about available international aid programmes, provide consultancy, and thus facilitate the funding of research projects which promise to succeed in the international competition for limited funds.

INTER-I(NFORM) is expected to increase the engagement of Czech research facilities in international R&D programmes and their success in obtaining funding and producing high-quality research output.

Eligible applicant entities are research organisations; the aid intensity may reach 100%.

6.1.5 The INTER-(V)ECTOR sub-programme

This sub-programme aims to strengthen the active role of Czech researchers in the managing authorities of leading international non-governmental organisations engaged in research and development.

The voice of the Czech scientific community in these bodies does not reflect its capacity and potential. As a result, the country lacks the opportunity to steer the development of science and research on an international scale.

Other countries are active in this respect as well, funding their efforts to secure their representation in the managing authorities of international institutions where the environment is considerably more competitive than on the national scene. Typically, institutional and specific-purpose funding are combined for this purpose (e.g. the sending institution meets the costs of its employees using funds for science and research provided from the central budget). Not all countries, however, have established special programmes to this end. The Czech Republic has decided to do so and has included the programme in the national aid system in order to standardize the decision-making rules regarding the participation of Czech representatives in individual projects, to conduct periodic reviews of the funded projects and to simplify the evaluation of their quality and outcomes.

The funding that aims to strengthen the role of Czech researchers in the managing authorities of leading international non-governmental organisation engaged in research and development will contribute to the potential for shaping the decisions and strategic plans on an international scale by Czech scientists.

INTER-V(ECTOR) is expected to strengthen the Czech representation, the ties between Czech and foreign research communities and the awareness and prestige of Czech science.

INTER-V(VECTOR) exhibits synergies mainly with INTER-T(RANSFER).

Eligible applicant entities are research organisations; the aid intensity may reach 100%.

6.1.6 The INTER-(E)UREKA sub-programme

This sub-programme supports international cooperation between industrial companies and research organisations, building on the EUREKA international programme.

In terms of labour productivity growth, Czech industry lags behind other countries of the former Eastern Bloc. At the same time, the gap between labour productivity growth in Western Europe and Central and Eastern European countries keeps widening.

To counter these undesirable trends, the collaboration between industry and research organisations/higher education institutions needs to be improved, together with the attractiveness of the Czech Republic to investors, while the country must offer qualified labour force available for developing high-added-value industry sectors. Synergistic effects can be achieved by applied research collaboration between Czech companies, namely small and medium-sized enterprises, Czech research organisations and foreign partners. INTER-E(UREKA) directly builds on the EUREKA international programme.

EUREKA promotes closer relationships between industrial companies of all sizes and research organisations by labelling selected projects with the “EUREKA status”, a “quality label” which enables proposers to apply for co-funding from public specific-purpose funds in their home countries. Co-funding EUREKA projects is a necessary precondition for a country to become a member of EUREKA. Every member state defines its own methods and financial aid rules for supporting its investigator entities under the programme, depending on their national priorities and available budget.

INTER-E(UREKA) is expected to boost the research and development output in the form of patents, utility designs and equivalent results of applied research, where the Czech Republic lags behind the rest of Europe.

Participation in EUREKA and the award of the “EUREKA status” is a necessary precondition for participating in the sub-programme.

Eligible applicant entities include small, medium-sized and large enterprises based in the Czech Republic and engaged in research. Research organisations may join as additional participants.

6.2 Large infrastructures for research, development and innovation

The operation of excellent research infrastructures in the EU was identified in the previous period as one of the key preconditions for effective growth of R&D, the competitiveness of national research and innovation systems in EU countries, and the European Research Area and European economy. Addressing today’s increasingly technologically complex and intricate socio-economic challenges becomes more feasible when expertise is shared across research infrastructures coordinated on an international scale.

6.2.1 General information

“Research infrastructure” means facilities, resources and related services that are used by the scientific community to conduct research in their respective fields and covers scientific equipment or set of instruments, knowledge-based resources such as collections, archives or structured scientific information, enabling information and communication technology-based infrastructures such as grid, computing, software and communication, or any other entity of a unique nature essential for conducting research. Such infrastructures may be 'single-sited' or 'distributed' (an organised network of resources). Czech legislation specifies the large research infrastructure as “a research facility necessary for comprehensive and financially and technologically-intensive research and development activities as approved by the government, which is established for use by other research organisations.”

When research infrastructures are operated within an integrated international space – in accordance with principles of the open access policy – their users can achieve results which they might not be able to produce as individual actors in their home institutions. In this respect, research infrastructures contribute to the effective use of public spending on R&D, and prevent fragmentation and duplication of the efforts of isolated research organisations. Users or international research infrastructures gain access to state-of-the-art equipment, instruments and expertise for excellent R&D.

Over recent years, the Czech Republic has recognized the increasing importance of research infrastructures to its national research and innovation system and has taken a number of steps to facilitate their building, operation, funding, development and integration into international structures.

Research infrastructures fall into three groups by their type: single-sited research infrastructures, distributed infrastructures comprising multiple sites and virtual research infrastructures. Based on their life cycle, research infrastructures may be in their preparatory phase, implementation phase, construction phase, operational phase or decommissioning phase. Except for the decommissioning phase, all of them can be found in the national research and innovation system of the Czech Republic. A singular type of a large research infrastructure project in the Czech Republic is an infrastructure operated for the purpose of securing the participation of the country in a large international research infrastructure abroad. It involves development and "in-kind" contribution of experimental equipment for an international research infrastructure being constructed or upgraded (such as CERN). Where this international research infrastructure is administered by an international organisation established according to international public law or according to ERIC, any additional obligations arising from the membership of the Czech Republic (e.g. payment of mandatory member fee for the country) are handled by the Ministry of Education of the Czech Republic as the competent body on behalf of the country.

6.2.2 Financing

Operating costs of large research infrastructures are covered by the Ministry of Education of the Czech Republic from the state budget for research, experimental development and innovation, the specific-purpose expenditure is entitled Projects of Large Research Infrastructures (LM). The Ministry of Education plans to use these funds for the years 2020-2022 as well. In 2020-2022, capital costs are to be met from the ESIF funds, specifically from RDEOP, based on evaluation of two calls (Research Infrastructures II and Research e-Infrastructures). The total specific-purpose aid from the Ministry of Education for 2020-2022 will reach CZK 1890 million/year.

In 2019, R&D Council established a working group for large research infrastructures (LRI) to identify research infrastructures as well as LRI for setting up a scheme of the source of their funding and the desired funding contributions after 2022. In 2019, the government approved the Innovation Strategy of the Czech Republic 2019-2030. One of the pillars in this strategy are Innovation and Research Centres. One of the objectives was to set up a complementary scheme of funding for RDI facilities in the form of institutional funding intended for long-term strategic development of research organisations and large research infrastructures on one hand and tools for supporting long-term strategic collaboration between the public research sector and industry in the form of National Centres of Competence on the other hand. Members of the working group have agreed on the following principles:

- The capacity of a large research infrastructures should be available to all potential users, regardless of their institutional and public sector or business background.
- Specific-purpose funding from the Ministry of Education for large research infrastructures should cover a majority of their operating costs to keep their budgets stable and their expenditure and activities predictable, as they embody strategic investment of the country in knowledge economy and international competitiveness.
- In this open access arrangement, free access to large research infrastructures is available to any potential users who submit to the infrastructure operator a proposal for use of the infrastructure which meets the quality and relevance criteria. An open competition then leads to selection of winning users based on quality and relevance of their proposals.
- In the contract RDI arrangement, the capacity of a large research infrastructure is available to any potential user who pays the costs of the proportion they use. For this purpose, large research infrastructures should assign a portion of their capacity for use by contract partners (within the limits set out in European legislation which provides for the compatibility of public aid with the internal market of the EU) based on an ex-ante analysis of the potential for such use.
- Pressure should be put on continuous evaluation of the quality of services of large research infrastructures in the Czech Republic with respect to foreign infrastructures, reflecting the experience of foreign users and the infrastructure's renown. If a substantial part of the capacity of a large research infrastructure were utilized by foreign entities (i.e. beyond the extent which stimulates its development), it should be either compensated by utilization of other research

infrastructures governed by international treaties or as part of international research infrastructure networks or the operational and investment costs should be shared in budget terms.

In 2021, large research infrastructures in the Czech Republic and their new proposals will be evaluated. The data will become part of an independent document to be submitted to the Czech government to decide on public funding for large research infrastructures for 2023-2029. In the draft long-term budget of the Czech Republic related to spending for research, development and innovation for 2022-2025 submitted by the Ministry of Education, the unavailability of ESIF after 2022 is reflected. Specific-purpose funding by the Ministry of Education of the Czech Republic includes allocation for investment costs of large research infrastructures which, until 2022, can also be met by ESIF funds provided through RDEOP. Gap analysis and ex-ante evaluation will be conducted on new proposals for large research infrastructures. The purpose is to explore the socioeconomic demand for new large research infrastructures and identify relevant areas in the Czech Republic. Based on this international evaluation, a budget framework will be developed in 2022 for funding large research infrastructures in 2023 and onwards as part of preparation of the country's budget for research, development and innovation for 2023 and medium-term projections for 2024 through 2025. Large research infrastructure are expected to be funded from the public funds of the Czech Republic in 7-year periods starting in 2023. This is equivalent to the 7-year periods of the framework programmes of the EU for research, development and innovation and cohesion policy instruments. Two alternatives have been identified for securing public funding for large research infrastructures beyond 2022. In the first one, the Ministry of Education uses the state budget for research, development and innovation through the specific-purpose support provided by the Ministry to cover the operating costs of large research infrastructures and the ESIF funds to meet the investment costs. In the second one, the Ministry of Education uses the state budget for research, development and innovation through the specific-purpose support to cover both operating and investment costs of large research infrastructures.

6.2.3 International structure

The body responsible for membership of the Czech Republic in ERIC entities is the Ministry of Education of the Czech Republic as it also administers large research infrastructures and international cooperation in research and development. The ministry deals with matters of membership of the country in the ERIC entities (as detailed below) and represents the country in their managing bodies. The Ministry operates in close cooperation with representatives of the Czech research community who are responsible for the research matters of the membership. For European distributed research infrastructures, this typically means operation of a Czech national contact node. For European single-sited research infrastructures, the Czech research community is typically involved through in-kind technology contributions.

In legal terms, the increased emphasis on pan-European research infrastructures led in 2009 to the creation of a new EU legal framework defining special management principles and funding methods. A new type of legal person was defined – **European Research Infrastructure Consortium (ERIC)** – which offers various flexible management models for pan-European research infrastructures and exemption from value added tax for their operators. The ERIC is set up by a decision of the European Commission upon an application by potential ERIC member states. ERIC members may include states and international organisations. Besides the legal framework for establishment, ERIC differs from international organisations in the way their member states contribute to the operating and investment costs of the research infrastructure.

Whereas the only obligation of a member state of an international organisation established according to international public law is typically the payment of a mandatory contribution, the obligations of ERIC member states may take various forms. The contribution to the operation of ERIC may take the form of a mandatory membership fee, a contribution to direct operating or investment costs, activities involving operation of part of the research infrastructure (e.g. a national "node" of a distributed research infrastructure) or a combination of the above, and may be provided in-cash or in-kind.

The ERIC framework is beneficial in that the ERIC legal person, while a legal person is a typical necessary precondition for international research infrastructures, is simpler to set up than international R&D organisations governed by international public law.

In the previous years, the Czech Republic became a member state of 14 ERIC infrastructures.

- **BBMRI-ERIC** (Bio-banking and Bio-molecular Resources Research Infrastructure),
- **CERIC-ERIC** (Central European Research Infrastructure Consortium),
- **CESSDA ERIC (**Consortium of European Social Science Data Archives),
- **CLARIN ERIC** (Common Language Resources and Technology Infrastructure),
- **DARIAH ERIC** (Digital Research Infrastructure for the Arts and Humanities),
- **EATRIS-ERIC** (European Infrastructure for Translational Medicine),
- **ECRIN-ERIC** (European Clinical Research Infrastructure Network),
- **ESS ERIC (**European Social Survey),
- **Euro-BioImaging ERIC** (European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences),
- **European Spallation Source-ERIC,**
- **EU-OPENSCREEN ERIC** (European Infrastructure of Open Screening Platforms for Chemical Biology),
- **ICOS ERIC (**Integrated Carbon Observation System),
- **Instruct ERIC (**European Integrated Structural Biology Infrastructure),
- **SHARE-ERIC** (Survey of Health, Ageing and Retirement in Europe).

The competent decision-making body is the Ministry of Education (which is responsible for international collaboration in R&D and large research infrastructures). In the process, the MEYS will continue to take into account the outcomes of international evaluation of the Czech large research infrastructure which is to join the pan-European infrastructure. The Ministry will only accept the obligation if funding is allocated to the infrastructure by a resolution of Czech government.
There are some international research infrastructures which have not been established under ERIC or public international law but under legislation of their host countries (Jules Horowitz Reactor). The state is not a member in these entities and does not perform any member obligations, such as payment of the membership fee. Large research infrastructures of this kind operate as “access points” to international research infrastructures and the project holder handles on behalf of the community of users in the Czech Republic the matters which are dealt with by the Ministry of Education on behalf of the country in those entities which have been established according to public international law or ERIC. There is a special type of research infrastructures in the Czech Republic which are not funded from grants for large research infrastructures but through other legal frameworks. These are LRIs in which the Czech Republic is a member state (e.g. CERN, EMBC, EMBL, ESA), as describe in other chapters.

The Ministry of Education of the Czech Republic financially supports direct engagement of Czech large research infrastructures in international large research infrastructures. Those include, for instance:

- **BNL** *(Brookhaven National Laboratory – United States of America)*;
- **CTA** *(Cherenkov Telescope Array – Chile, Spain)*;
- **FAIR** *(Facility for Antiproton and Ion Research – Germany)*;
- **Fermilab** *(Fermi National Accelerator Laboratory – United States of America)*;
- **ILL** *(Institut Laue-Langevin – France)*;
- **JHR** *(Jules Horowitz Reactor – France)*;
- **LSM** *(Laboratoire Souterrain de Modane – France)*;
- **Pierre Auger Observatory** *(Argentina)*;
- **SPIRAL** *(Système de Production d’Ions Radioactifs Accélérés en Ligne – France)*.

The Ministry of Education of the Czech Republic will continue to support the integration of Czech large research infrastructures into ERIC infrastructures, as well as those infrastructures established according to national regulations. The support will be part of the support for large research infrastructures of the Czech Republic, based on the outcomes of international evaluation and will depend on funding allocated by Czech government resolutions.

Further information can be found at this address:
http://www.msmt.cz/vyzkum-a-vyvoj-2/velke-infrastruktury-vyzkumu
https://www.vyzkumne-infrastruktury.cz/

6.2.4 Road map

The Road Map for the Czech Republic is based on the ESFRI Road Map which was developed for the first time in 2006. The last update was made in 2018 and the next is planned for 2021. The ESFRI road map as an analytical study covers European research infrastructures which were either implemented by the host countries or are under preparation or construction, and places them in the context of the European landscape of research infrastructures. The road map of large research infrastructures in the Czech Republic includes a strategic model for support of large research infrastructures for 2016-2022 which stresses effective use of Czech government funding and ESIF funds, specifically those from RDEOP. This model presents complementary and highly efficient use of both budget sources. It gives information on all 48 large research infrastructures in physics, power generation, environmental sciences, biomedicine, social sciences and humanities and ICT which are to receive aid from public funds of the Czech Republic until 2022. The latest update to the Road Map of the Czech Republic made in 2019 followed the approval of funding for large research infrastructures until 2022. The Road Map of the Czech Republic for large research infrastructures includes exclusively those large research infrastructures for which the government approved funding through specific-purpose support of the Ministry of Education until 2022, which makes them eligible to take part in the complementary call under RDEOP for their investment costs.

6.3 Development and international cooperation institutions

Several institutions are active in securing and arranging international cooperation in the Czech Republic. The prominent ones are listed below.

6.3.1 CZERA 3

Since 2013, comprehensive support for participation of Czech organisations in the ERA has been provided under the CZERA (Czech Republic in ERA) infrastructure project, specifically under its Module III. As part of CZERA 3 project, the Technology Centre AS CR runs the NCP service (National Contact Person) for FP9. CZERA 3 (Interexcellence) follows on from the research infrastructure project CZERA 2 (Czech Republic in the European Research Area 2015-2017) and CZERA and secures their continuity, as well as additional expanding and innovative activities. CZERA 3 is an expert framework for a wide range of consultancy and support services for proposers and project participants in Horizon 2020 and analytical and information services for decision makers developing the RDI policy, particularly in the field of international scientific cooperation.
The project comprise eight activity groups which correspond to the requirements of the European Commission for the nation-wide NCP system. Professional analytical services are purposefully linked to the programme to enable public administration and RDI organisations to acquire structured information and source documents for strategic decision-making.

www.evropskyvyzkum.cz

6.3.2 Czech Liaison Office in Brussels – CZELO

The Czech Liaison Office (CZELO) was established in Brussels in 2005. It is run by the Technology Centre of AS CR, and supported from a grant of the Ministry of Education. The office facilitates the information exchange between the European Commission and the Czech research community.

It aims to involve Czech partners in the European research cooperation through framework programmes. The office provides its services to researchers in all disciplines and to research organisations in the Czech Republic free of charge. Similar offices in Brussels are run by many other Member States. All of them are associated in the informal IGLO network.

CZELO is funded from the INTER-EXCELLENCE programme of the Ministry of Education and is run by the Technology Centre AS CR. The office is part of the Czech network of regional and sectoral contact organisations which provide services in respect of EU-NINET framework programmes. It cooperates with the National Information Centre for European Research, i.e. the group of national contact persons for framework programmes (NICER). The services are offered by the office free of charge. In 2017, project CZELO 4 (LTI17010) was launched which is to be completed at the end of 2020.

More information about the programme, including contacts, can be found at the following addresses:
www.iglortd.org
www.czelo.cz

6.3.3 Enterprise Europe Network (EEN)

EEN provides professional services for boosting competitiveness primarily among small and medium-sized enterprises. The goal is to help them exploit the business opportunities of the single market of the EU as well as the markets outside the Union. Activities of the network include assistance in international technology transfer, support for seeking foreign business contacts and project partners of international research and technical cooperation. The network offers consultancy in matters of intellectual property and seeks funding for innovation projects.

EEN operates in more than 60 countries across the globe, bringing together more than 600 entrepreneurship-supporting organisations. In the Czech Republic, it is represented by Enterprise Europe Network Česká republika, which is a consortium of six partners coordinated by the Technology Centre AS CR. EEN ČR is funded by the European Union under the COSME programme and by the Ministry of Industry and Trade.

More information about the programme, including contacts, can be found at the following address:
https://www.enterprise-europe-network.cz/

6.3.4 EURAXESS

International mobility in the Czech Republic is facilitated by EURAXESS, a network of centres coordinated by the Centre of Administration and Operations of the AS CR with long-term financial support from the Ministry of Education. The network offers comprehensive information services regarding international mobility to foreign and Czech researchers (and their families).

More information about the programme, including contacts, can be found at the following address:
https://www.euraxess.cz/cs

6.4 International activities of Czech Science Foundation

This type of collaboration focuses on joint bilateral grant-funded projects. Proposals for international projects in the English language are submitted as tenders to both agencies. They must conform to all requirements set by CSF and the other national agency. Public tenders are expected to be held on an annual basis, typically at the turn of February. The project duration is 2–3 years Project proposals should be based on complementary methodologies and procedures. Each project proposal should include a responsible investigator on the Czech part and another one in the other country. At Czech Science Foundation, project proposals are submitted via on-line application GRIS. Czech applicants are required to follow the tender dossier applicable to the year of project submission. The current cooperation involves the following partners:

- Taiwan
- South Korea
- Germany

- São Paulo
- Russia

More information about the programme, including contacts, can be found at the following address: https://gacr.cz/mezinarodni-aktivity/bilateralni-spoluprace/

Czech Science Foundation is a member of other international structures which foster effective cooperation in research and development.

6.4.1 Science Europe (SE)

Science Europe (SE) is an association of European Research Funding Organisations (RFO) and Research Performing Organisations (RPO). SE takes over and develops numerous activities previously realized by ESF, which wound down its activities at the end of 2015.

SE was established in 2011 and is based in Brussels. It comprises 52 organisations from 27 European countries. The Czech Science Foundation, one of its founding members, is currently the only member from the Czech Republic. SE also cooperates with other entities, such as European universities and academies, European scientific intergovernmental organisations, governments, and the European Commission. It also helps develop the European Research Area (ERA) through its direct negotiations with key partners.

This association's main interests include coordination of actions and strategies of European organisations which support and carry out research, in order to boost the competitiveness of the European research and science sector across the globe. SE therefore supports the activities of each member organisation, as well as their cooperation in strategic terms or specific tasks. SE collaborates with research organisations based outside Europe. It champions the interests of the scientific community to ensure that, in collaboration with the European Commission, the contributions of member organisations to the development of ERA are maximised and that publicly funded research and innovation in Europe has the maximum impact, contributing to the development of the economy and providing solutions to deliver societal benefit.

One of the Czech Science Foundation's main interests within the SE is the Open Access issue, i.e. the accessibility of scientific data and outputs

More information about the programme, including contacts, can be found at the following address: https://gacr.cz/mezinarodni-aktivity/science-europe/

6.4.2 Global Research Council

The Global Research Council (GRC) was established in 2012. The Czech Science Foundation is one of its founding members. The GRC brings together national science funding agencies for basic research from Europe, Asia, Africa, Latin America and the USA. The core ideas for establishing the organisation were to provide a forum for communication and cooperation among funding agencies, advancing shared interests and principles of science funding, sharing best practices with basic research funding in various countries, coordinating the sharing of information and data, and supporting excellent research and excellent research teams across all continents.

More information about the programme, including contacts, can be found at the following address: https://gacr.cz/global-research-council/

6.4.3 CEUS

In 2019 the leaders of CSF, FWF (Austria), NCN (Poland) and ARRS (Slovenia) signed CEUS – Central European Science Partnership Lead Agency Agreement: Memorandum of Understanding on the unilateral administration and mutual recognition of evaluation procedures". This new partnership will enable researchers from the Czech Republic, Austria, Poland and Slovenia to conduct research projects in collaboration with new foreign partners. In the framework of CEUS, an initiative promoting basic research in Central Europe, researchers are no able to propose bilateral and trilateral projects under the Lead Agency principle. The fundamental criterion for identifying the lead agency is the agreement of the international research team as to the origin of the key theme to be investigated in the

project and as to the volume of the budget for the international team which submits the project proposal.

More information about the programme, including contacts, can be found at the following address: https://gacr.cz/mezinarodni-aktivity/la-spoluprace/

6.5 International activities of the Technology Agency of the Czech Republic

TA CR cooperates with numerous foreign partners on multiple levels. One of them is the Finnish agency TEKES. Although Finland went through a deep crisis in the 1990s, it was finally able to turn things around. Its economy was restructured, incorporating new industrial sectors and innovation as its basis. Other notable foreign partners include the Zhejiang Tong Xiang International Chamber of Commerce, the Korea Institute for Industrial Technology (KITECH), and the National Centre for Research and Development (NCBR). An important segment of international cooperation of TA CR involves agencies from Visegrad Group countries. Know-how and best practice procedures are exchanged in order to foster research, development and innovation.

Information on the international activities of TA CR is available at: https://www.tacr.cz/o-nas/mezinarodni-spoluprace/

6.5.1 DELTA 2 programme (TM)

The full name of the programme is **DELTA 2 Programme of applied research, experimental development and innovation 2020 - 2025.** The DELTA 2 programme supports collaboration in applied research (including industrial research, experimental development and their combinations) through joint projects conducted by Czech businesses and research organisations supported from the Technology Agency of the Czech Republic and by foreign partners supported (possibly) from foreign technology and innovation agencies or equivalent institutions. Eligible projects are those which focus on specific output from applied research, i.e. those which generate new findings and skills for developing new or substantially upgrading existing products, processes or services or which directly lead to new products, processes or services. These projects must respond to the current or future needs of the given country.
The interaction between the Technology Agency of the Czech Republic and partner agencies will depend on their agreement regarding the methods of support, proof of qualification or other means of screening the foreign partners and Czech participants. The relevant conditions will be agreed between the public funding provider and the partner agency and announced as part of the public tender.
The programme has no specific theme: ad hoc topics may be defined for joint projects in individual public tenders. For each partner agency, the choice of research themes will be identified individually to reflect the priorities of the applied research in the countries involved.

The programme aims to ensure that public funding of applied research translates into economic or other societal benefits. The knowledge acquired will contribute to identifying the factors and processes which affect and determine the functioning and development of Czech society in the context of European integration and globalization. The programme is expected to attract industrial research projects (with some necessary activities of oriented, basic research) and projects predominantly involving experimental development.

Amount of state aid planned for the entire programme period (according to current conditions of the programme) *see earlier note about amounts*

Period	2020	2021	2022	2023	2024	2025	Total
Amount of aid (CZK)	150,000 thous.	250,000 thous.	250,000 thous.	275,000 thous.	200,000 thous.	100,000 thous.	1,225,000 thous.

Project period
The expected maximum project duration is 36 months. The project period must not extend beyond the period of the entire programme.

Form and amount of funding
The expected average aid intensity over the programme period is 74%. The aid intensity defined as a percentage of approved project costs is calculated separately for each project, each beneficiary and each additional participant. Where funding is granted to enterprises pursuant to the GBER, the maximum aid intensities defined therein apply. The planned maximum funding for a single project with participants from the Czech Republic is CZK 25m.

Table of maximum aid intensities for industrial research, experimental development and innovation for individual categories of participants

Activity category	Small enterprise	Medium-sized enterprise	Large enterprise	RO
Industrial research	70%	60%	50%	100%
Industrial research under conditions of effective collaboration	80%	75%	65%	100%
Experimental development	45%	35%	25%	100%
Experimental development under conditions of effective collaboration	60%	50%	40%	100%
Innovation for small and medium enterprises	50%	50%	0%	0%
Innovation in procedures and organisation	50%	50%	15%	100%

Aid beneficiaries
In accordance with the Support of Research and Development Act No. 130/2002 Sb., the Framework, and the GBER, eligible project aid beneficiaries include:

- **Undertakings –** legal entities, regardless of their legal form, and natural persons which (according to Annex 1 to the GBER) conduct economic activities, carry out the project alone or in cooperation with other participants, and prove their ability to co-fund the project from non-public resources**.**
- **Research and knowledge dissemination organisations** – legal entities which meet the definition of a research organisation according to Article 2, section 83 of the GBER and the Support of Research and Development Act and which carry out the project alone or in cooperation with other participants. Research organisations may apply for and receive aid alone in exceptional cases for which appropriate substantiation must be given in the tender dossier (e.g. when an applicant of this kind is expected to successfully commercialize the results and deliver a return on the investment).

The target group of applicants defined by the programme conditions may be narrowed down by the tender dossier. The programme imposes certain additional conditions. For instance, the participation of at least one partner from the country of the partner agency and at least one participant from the Czech Republic is required. The preferred model of cooperation is an enterprise working together with a research organisation. Furthermore, the involvement in the project must be approximately equal for all Czech partners (i.e. their shares in activities, the budget and results). Where an enterprise collaborates with a research organisation, at least one of the requirements set out by section 2.2.2., paragraph 28 of the Framework for State Aid must be met. The project must be either submitted as a proposal by a foreign participant to the partner agency or conducted already by the foreign partner with support from a partner agency with the appropriate theme. Applicants may continue to apply for aid under this programme even if the foreign partner fails to receive aid from the partner agency; i.e.

foreign partners may fund their involvement in the project from other sources, including their own. Czech participants attach relevant details to their project proposal about the role undertaken by the foreign participant, including the funding for the foreign participant.

The first public tender for project proposals was announced in 2019. Further public tenders are expected to be announced on an annual basis between 2020 and 2023.

More information about the programme, including contacts, can be found at the following address: https://www.tacr.cz/program/program-delta-2/

6.5.2 Kappa programme

In 2018, the Technology Agency of the Czech Republic took over administration of part of Norway Grants and announced the KAPPA funding programme and conditions for cooperation in research and development with partners from Norway and other countries. The programme focuses on international cooperation between Czech entities and partners from Norway, Iceland and Liechtenstein in applied research, and promotes contacts between research organisations and users of the outputs of applied research, experimental development and innovation, i.e. with industry, businesses and other domestic and international entities with their roots in various parts of society. There is no central theme to the programme (except for the condition imposed by Norway that approximately 30% of the total funds from Norway Grants goes towards projects for carbon capture and storage). The programme aims to ensure that public funding of applied research translates into economic or other societal benefits. The programme is expected to attract industrial research projects (with some necessary activities of oriented basic research) and projects involving predominantly experimental development. One of its purposes is to deliver synergistic and complementary effects in international schemes, such as H2020 and other EU programmes, and in international programmes with compatible orientations.

The total specific-purpose expenditure of the programme amounts to CZK 780,564,696. The specific-purpose funding from the EEA and Norwegian financial mechanisms reaches CZK 663,480,000 and the specific-purpose state budget expenses (the TA CR budget heading) are CZK 117,084,696. The expected average aid intensity for this programme is 80%.

The programme is planned for 5 years from 2020 to 2024. The first public tender for projects under the programme is yet to be specified. Over the programme period, one or two public tenders are to be announced. The minimum project period under this programme is 24 months. The maximum project period is 5 years. All projects must be completed before 30 April 2024.

More information about the programme, including contacts, can be found at the following address: https://tacr.cz/index.php/cz/programy/program-kappa.html

6.5.3 Cofund calls

ERA-NET Cofund is one of the mechanisms of Horizon 2020, a European framework programme for research and innovation (until 2025), which enables public funding providers from individual member states (such as Technology Agency of the Czech Republic), associated countries and some non-European countries to issue call for proposals for agreed themes. Applicants submit their proposals of consortium of international partners. Each public funding provider is responsible for financing the successful applicants from their country as selected on the international level. The list of foreign organisations involved in the call is published before the call is announced. As a public funding provider, Technology Agency of the Czech Republic takes part in cofund calls under ERA-NET in nanomedicine, biodiversity and climate, water pollution, ICST, non-agricultural materials, innovative materials, and gender in research and innovation. Additional themes, such as transportation and power generation are under preparation. The themes of current calls are published under the International Cooperation tab. The allocated funds of the Technology Agency of the Czech Republic for individual cofund calls under ERA-NET may differ but tend to vary around EUR 1 million. The maximum aid rate for the Czech part of the project is 70-100% of the eligible project costs. In the Czech Republic, both research organisations and businesses are eligible candidates.

More information about these activities, including contacts, can be found at the following address: https://www.tacr.cz/mezinarodni-spoluprace/

6.5.4 TAFTIE

TAFTIE is a European network of leading national innovation agencies. Its members contribute a great deal to strengthening Europe's economic performance by promoting innovation through implementing national and often international programmes in research, development and innovation. Membership in the network provides TACR with access to an enormous source of information and experience, which can be used in further development and in the preparation of further programmes of applied research, experimental development and innovation.

More information about these activities, including contacts, can be found at the following address: https://www.tacr.cz/o-nas/mezinarodni-spoluprace/taftie/

7 OTHER ACTIVITIES OF INTERNATIONAL COOPERATION

The Czech Republic is a member of numerous international organisations which support research and development. It also pursues collaboration through bilateral programmes. The core of these activities is administered by the Czech Ministry of Education.

7. 1 Memorandum of Cooperation

Agreements for R&D cooperation have been made with partners in several countries. Cooperation with these countries takes the form of separate calls or other programmes, such as INTER-EXCELLENCE.

7.1.1 Czech-Bavarian R&D cooperation

The Ministry of Education of the Czech Republic and the Bavarian State Ministry for Education, Science and the Arts announce joint calls for proposals of joint Czech-Bavarian research projects. The basis for these calls is the Joint Declaration of Intent of Scientific Cooperation between the Ministry of Education of the Czech Republic, and the Bavarian State Ministry for Education, Science and the Arts signed on 3 July 2014 in Prague.

Further information can be found at this address:
www.msmt.cz/vyzkum-a-vyvoj-2/cesko-bavorska-spoluprace-ve-vav

7.1.2 Czech-Chinese RDI cooperation

International cooperation between research facilities in the Czech Republic and People's Republic of China is based on the intergovernmental Agreement for Cooperation in Science and Technology signed on 1 June 1995, and on the Memorandum of Understanding for Joint Research and Development between the Ministry of Education of the Czech Republic and the Ministry of Science and Technology of the People's Republic of China, which was signed on 23 March 2016 in Prague.

Further information can be found at this address:
www.msmt.cz/vyzkum-a-vyvoj-2/cesko-cinska-spoluprace

7.1.3 Czech-Israeli RDI cooperation

On 25 November 2014, the Joint Declaration of Cooperation in Research and Development of the Czech Deputy Prime Minister for Science, Research and Innovation, and the Ministry of Science, Technology and Space of the State of Israel was signed in Jerusalem. On its basis, the Ministry of Education of the Czech Republic announce calls for proposals of Czech-Israeli projects in basic research or industrial research. The themes of these projects were set as the "environmental protection technology: pollution prevention and removal of contaminants from the air, soil and water sources" and "information and communication technologies with emphasis on data processing, transfer and storage".

The proposal of a joint research project must be submitted simultaneously by the Czech part of the team in the Czech Republic and by the Israeli part of the team in Israel and must comply with the criteria set by the respective support provider. The topics and contents of the proposals submitted separately by both teams in their countries must match. The aid intensity is 100% for basic research and 50% for applied research.

Further information can be found at this address:
www.msmt.cz/vyzkum-a-vyvoj-2/cesko-izraelska-spoluprace-ve-vavai

7.1.4 Czech-Japanese RDI cooperation

This cooperation has been launched by the Memorandum of Cooperation in Planning and Implementing Joint Calls EIG CONCERT-Japan signed by the Czech Ministry of Education on 13 July 2017. The goal of the Memorandum is to strengthen cooperation between European countries and Japan in science and innovation research, tackle today's societal challenges and meet societal needs,

and provide support for international multilateral research cooperation through planning, launching and implementing joint calls.

Project proposals are to be submitted via an on-line application to the European Interest Group for Collaboration with Japan (EIG CONCERT Japan). Czech applicants are required to submit the project proposal to MEYS as well, in accordance with instructions for the call.
The funding from MEYS enables participants to use it for salaries of scientists from academia, research organisations and small and medium-sized enterprises operating in both basic and industrial research. The funding is intended for joint projects involving purchasing of minor tangible assets, materials for research, personnel costs, the costs of mobility (costs of stay and travel).

Further information can be found at this address:
http://www.msmt.cz/vyzkum-a-vyvoj-2/cesko-japonska-spoluprace

7.2 Czech-Norwegian research programme

The CZ09 programme has ended but tools for a new programming period are being implemented. Priority areas aligned to EU priorities are outlined in “Blue Book”, reflecting the major challenges that Europe is facing. Open calls are launched by agents responsible for relevant programmes. The agent responsible for most programmes (most of them are non-R&D) is the Ministry of Finance of the Czech Republic, acting as the National Focal Point for EEA financial mechanisms and Norway Grants in the Czech Republic. Agents for the CZ09 programme area – Fund for Research Support include the Ministry of Education and the Technology Agency of the Czech Republic.

Further information can be found at these addresses:
www.eeagrants.org/
www.msmt.cz/vyzkum-a-vyvoj-2/norske-fondy

7.3 Cooperation between the EU and the Russian Federation (ISTC) and Ukraine (STCU)

International cooperation pursued by the EU in research and development includes the support of research and development in the Russian Federation and Ukraine. This effort aims to help reorientate military research towards civilian purposes. As part of this effort, the International Science and Technology Centre (ISTC) in the Russian Federation, and the Science and Technology Centre in Ukraine (STCU) have been established.

They organise cooperation in science and technology between the facilities in the EU Member States, and in the Russian Federation and Ukraine. ISTC and STCU are intergovernmental organisations founded in 1992 based on an agreement between the EU, USA, Japan, and the Russian Federation (and Ukraine).

Their objective is to offer highly-qualified scientists in military research programmes in the former Soviet Union an opportunity to apply their talent to civilian activities.

Further information can be found at these addresses:
www.istc.int
www.stcu.int
https://www.evropskyvyzkum.cz/cs/nastroje-spoluprace/mezinarodni-organizace/stcu-istc

7.4 The Fulbright Commission

The Fulbright Commission is a state institution established by the Czech Ministry of Education and funded by contributions from the state budget. The work of the Commission is co-financed by the governments of the United States and the Czech Republic. The American side bears all personnel costs (wages, costs, and benefits) and the operating costs of the Advising Centre, which provides information about study in the United States. The Czech side bears the operating costs of the office space. Scholarship programmes are co-financed by both partner states.

The main objective of the Fulbright Commission is to support educational, scientific and cultural exchanges between the Czech Republic and the United States of America. The Commission offers scholarships, grants and other programmes for study, teaching and research in the Czech Republic and the United States. It receives and processes proposals, organises selection procedures and assists Czech scholarship holders with their study in the United States, and selects and supports American scholarship holders in the Czech Republic.

Further information can be found at this address:
www.fulbright.cz

7.5 NATO Science Programmes – Civilian Research

Science for Peace and Security Committee (SPS)
The Science for Peace and Security (SPS) Committee formed by a merger of the Science Committee and the Committee on the Challenges of Modern Society in order to support international cooperation in science and innovation. The objective of the SPS Committee is to contribute to the security, sustainable development, stability and solidarity among nations through cooperation, infrastructure expansion, democratic development, and fostering economic growth. The SPS Programme is funded from the NATO budget. Applications are submitted by scientists or developed by the SPS secretariat or, on the national level, drafted by individual countries.

The SPS Programme awards grants to scientists from NATO and partner countries, and the Mediterranean Dialogue countries. Grants are also provided to academic institutions in partner states for the development of computer infrastructure and optimisation of electronic communication. As a rule, there must be cooperation between scientists from NATO countries and scientists from partner states or Mediterranean Dialogue countries. Applications are submitted to the NATO headquarters for evaluation. For individual disciplines, there are committees of international experts, which convene three times a year to evaluate the applications.

Those eligible for grants are scientists from the NATO countries, partner states and Mediterranean Dialogue countries. Each application must be submitted jointly by an applicant from a NATO country and an applicant from a partner or Mediterranean Dialogue country. The proposals often involve partners from other NATO and partner countries, and Mediterranean Dialogue countries, depending on the subject.

Applications can be submitted at any time. The dates of individual rounds are 1 March, 1 July and 1 November.
Applications for funding from national resources must be developed by individual states in accordance with the guidelines. They should focus on the key priorities defined by the SPS Committee.

The priorities have three main categories:

- Counter-terrorism,
- Meeting other security challenges,
- Priorities of partner countries.

The grant mechanisms under the programme include: Pilot studies for 3–5 years, short-term projects with a specific focus taking 12–24 months, and topical workshops. Support grants facilitate the participation of foreign experts in national projects.

NATO – Russia Council (NCR)
This is a specific programme aimed at supporting cooperation between scientists from Russia and NATO countries in seven priority areas: detection of explosives, psychological and social ramifications of terrorism, disaster prediction and prevention, CBRN defence, cyber security, transportation security, including border security, and issues related to environment protection. No deadlines were set for submitting applications, with individual rounds taking place on the following dates: 1 March, 1 July and 1 November.

Further information can be found at this address:
www.nato.int/science/about_sps/introduction.htm

7.6 European Space Agency (ESA)

The European Space Agency (ESA) is an intergovernmental organisation for space research and technologies, and their applications. The ESA's mission is to coordinate and harmonise the European astronautic strategies and policies, expand the scientific knowledge about our planet, the Solar System and space, and about materials and living organisms using the International Space Station, satellites and interplanetary probes, and mobilize a broad technical base and support of the European industry to produce and operate space systems and ground infrastructure, and use technical knowledge and skills to meet the ever increasing demands of the society and the market.

The ESA activity programme and its scope is defined by the ESA Ministerial Council, depending on available funding. The Council convenes once in every two or three years, attended by designated ministers from the Member Countries.

The ESA's activity is managed by the ESA Council and its Committees (Industrial Policy Committee, Scientific Programme Committee, Administration and Finance Committee, and International Relations Committee). ESA optional programmes are managed by Programme Committees. All these bodies are composed of delegates of Member Countries and, where relevant, countries involved in the optional programme. The Czech Republic became an ESA member on 12 November 2008. The ESA activities are divided into mandatory and optional ones.

The mandatory activities include the General Studies Programme, Science Programme, Science Core Technology Programme, and the Technology Transfer Programme. Then there are the Innovation Triangle Initiative (ITI), the Basic Technology Research Programme, Centre Spatial Guyanais, and programmes of Experiments for University Students (BEXUS and REXUS).

The Czech Republic takes part in the optional programmes of scientific research (PRODEX), technology programmes (GSTP), programmes of life sciences studying microgravity conditions (ELIPS), Earth observation (EOEP), development of meteorological satellites and satellites for Earth observation (MTG and MetOp-SG), Mars robotic exploration (MREP), space weather and near-Earth objects (SSA-SWE and SSA-NEO), development of launchers and space vehicles (FLPP), navigation (EGEP), and research in telecommunications (ARTES 1, ARTES 5, ARTES 14, ARTES 20).

Further information can be found at these addresses:
www.czechspace.cz
www.esa.int/esaCP/Czech.html

7.6.1 Programme for development of scientific experiments (PRODEX)

PRODEX (PROgramme de Développement d'Expériences scientifiques) is an optional programme of ESA intended primarily for funding the development and construction of scientific instruments and experiments designed by research facilities in ESA member states for research into outer space and celestial objects and for research in other relevant domains, such as microgravity, remote sensing and others. The idea behind PRODEX was to enable costly experiments of this kind to be funded in small ESA member states and to promote collaboration between research facilities and industrial companies. PRODEX is managed by the Netherlands-based ESA PRODEX Office (ESTEC). The Head of the PRODEX Office reports to the Director of Science at ESA and communicates directly with delegates from individual member states. Czech participation in a project is subject to approval by the Czech delegation in the ESA, i.e. by the Ministry of Education of the Czech Republic (MEYS). The annual contribution from the MEYS for 2017– 2021 is €2.2 million.

Further information can be found at this address:
http://www.msmt.cz/vyzkum-a-vyvoj-2/evropska-kosmicka-agentura-program-vyvoje-vedeckych

7.7 EMBC, EMBO, EMBL and the ELIXIR project

The European Molecular Biology Conference – EMBC is an intergovernmental organisation supporting activities in molecular biology and related fields.

The European Molecular Biology Laboratory (EMBL) is an international research organisation established in 1973 by EMBC member countries. With its headquarters in Heidelberg, Germany, it brings together 21 European countries which are also members of the EMBC. It has built the most important and technologically most advanced European research infrastructure for molecular biology and genetics. Its research activities are pursued in five sites: Heidelberg, Cambridge, Grenoble, Hamburg, and Monterotondo. In June 2013, the EMBL Council approved an official application of the Czech government for membership. Full membership was granted to the country in 2014 after a ratification procedure. The motivation for joining the organisation was the prospect of integrating the Czech research centres Central European Institute of Technology (CEITEC), Biotechnology and Biomedicine Center of the Academy of Sciences and Charles University in Vestec (BIOCEV) and the International Clinical Research Center of St. Anne's University Hospital Brno (FNUSA-ICRC) into broad international cooperation. The access is, however, very valuable for a number of other research facilities as well (the Institute of Molecular Genetics of the Academy of Sciences of the Czech Republic, the Institute of Macromolecular Chemistry of Academy of Sciences of the Czech Republic, the Institute of Biophysics of the Academy of Sciences of the Czech Republic, Masaryk University in Brno, Charles University, and the Institute of Chemical Technology Prague). More detailed information on EMBL can be found at http://www.embl.org.

The European Molecular Biology Organisation (EMBO) is a non-governmental organisation whose members are leading European scientists from the various fields of molecular biology. EMBO is in charge of implementing the EMBC General Programme. Therefore, the individual activities under the General Programme carry the EMBO name.

Each year, EMBC and EMBO jointly award more than 600 scholarships for research, and organise more than 70 courses and conferences. There are two deadlines for applications, 15 February and 15 August.

The EMBO Young Investigators programme aims at excellent young scientists in the first years of establishing their research laboratories. Being selected for this programme equals a prestigious recognition of the quality of one’s scientific work. Those selected receive a three-year grant of €15,000 per year, and have a unique opportunity to meet previous awardees and EMBO members. The application deadline is 1 April.

A special Installation Grant programme was launched in selected EMBC Member States, including the Czech Republic, to support research in molecular biology and related sciences. The grants are intended for research team leaders who plan to establish their own laboratory, have an excellent publication record, and had received an offer from an organisation to host such laboratory. In addition, the applicants must have worked for at least two consecutive years outside the planned host country. The application deadline is 15 April each year.

The EMBC also supports the EMBO Science for Society programme, which promotes dialogue between scientists and the society, and the Electronic Information Programme which provides web-based services for the EMBO science community.

EMBC funds various prestigious Europe-wide meetings to foster cooperation, exchange of experience, and advances in molecular biology. Their annual attendance is more than 5,000 scientists. Hands-on courses enable them to acquire new skills for state-of-the-art techniques, and workshops provide a discussion forum for various fields.

In 2011, the ELIXIR infrastructure project was launched under the auspices of EMBL. Its objective is to build and maintain a Europe-wide distributed infrastructure for acquisition, classification, storage, and dissemination of data from molecular biology research projects across a range of life sciences: biology, chemistry, medicine, pharmacy, and others. The project headquarters are in Hinxton, UK. Today, a total of 12 countries are taking part in the project, and another 6 have signed the Memorandum of Understanding. The project has been included in the ESFRI Roadmap, as well as in the Roadmap of Large Infrastructures for Research, Experimental Development and Innovation of the Czech Republic. Having signed the ELIXIR Consortium Agreement in November 2013, the Czech Republic has become one of the five founding members of the consortium. The Czech national Node entitled "ELIXIR-CZ" now operates under the coordination of the Institute of Organic Chemistry and Biochemistry of the Academy of Sciences of the Czech Republic.

Further information can be found at these addresses:
www.elixir-europe.org
www.embo.org

7.8 Organisation for Economic Cooperation and Development (OECD)

The Organisation for Economic Cooperation and Development is an intergovernmental organisation of 34 countries from around the world. The Czech Republic has been a member since 1995.
The Czech Ministry of Education (MEYS) represents the Czech Republic on the Committee for Scientific and Technological Policy, and in its working groups: Technology and Innovation Policy, Working Party on Biotechnology, and Working Party on Nanotechnology. MEYS contributes to the cooperation in research and development by drafting reports and processing extensive questionnaires which serve as source documents for OECD analyses and studies and, most notably, the Science, Technology and Industry Outlook, which offers a comparative analysis of policies and tools across the OECD and many developing countries. In addition, the MEYS contributes to thematic projects of the working groups (most recently the "Innovation-driven Growth in Regions: The Role of Smart Specialisation" project, and "Financing, Transferring and Commercialising Knowledge") as well as OECD's horizontal projects (e.g. the Innovation Strategy, and the Green Growth Strategy). The objective is to use the outputs and concrete recommendations from these projects to shape national policy and strategy. The MEYS is working on matters related to research organisations in horizontal thematic projects of new technologies, which are seen as the basis of economic growth and collaboration between the public and private sectors (e.g. the Innovation Strategy, and the Green Growth Strategy). Other topics include recruiting human resources, acquiring knowledge, skills, and fostering career growth, as well as international cooperation in the context of the growing importance of exploitation and sharing of R&D experience among OECD Member States.

OECD's committees employ the analytical and multidisciplinary approach for formulating qualified recommendations for dealing with today's problems. The nature of these challenges requires closer collaboration with some non-member countries and international organisations as well.

Further information can be found at this address:
www.oecd.org

7.9 European Southern Observatory (ESO)

Since 2007, the Czech Republic has been a regular member of the European Organisation for Astronomical Research in the Southern Hemisphere, also known as the European Southern Observatory. This international organisation brings together 16 countries. ESO operates multiple sites, including the technologically most advanced astronomical observatory on the Paranal Mountain in Chile. Together with partners from the USA, Canada, Brazil, South Korea and Japan, it is a member of the ALMA consortium which operates the largest ground-based array of antennas for observation outside the visible light range on Llano de Chajnantor in the Atacama Desert in Chile. ESO's current effort focuses on building the European Extremely Large optical/infrared Telescope (E-ELT) by 2021, the largest mirror-based telescope in the world. The ESO headquarters are located in Garching, near Munich, Germany. It is the scientific, technical and administrative centre of ESO. Astronomers in the

Czech Republic can benefit from the ESO membership through using unique ESO observation technologies in their projects, and Czech doctoral students have an opportunity to complete internships in state-of-the-art observatories. Finally, enterprises from the Czech Republic can compete for the organisation's contracts in mechanics, optics, software and other fields.

Further information can be found at this address:
www.eso.org/public

7.10 European Organization for Nuclear Research (CERN) and the Joint Institute for Nuclear Research (JINR) in Dubna

The Czech Republic is a regular member of CERN and JINR Dubna, international organisations for research in nuclear and subnuclear physics and high-energy physics. The cooperation is maintained by the Committee for Cooperation with the CERN and the Committee for Cooperation with the JINR Dubna. The matters of both memberships are managed and funded by the Ministry of Education (O31 – The Department of Research and Development of the MEYS). Projects involving partnership with CERN and JINR are co-funded from the INGO II programme.
Specific-purpose funding is provided by the Ministry of Education for the participation of Czech institutions in major CERN programmes, such as ATLAS, ALICE, COMPASS, TOTEM, and others. The collaboration of Czech facilities with JINR in joint projects is funded from the Czech contribution to JINR.

Further information can be found at these addresses:
https://home.cern/
www.particle.cz/vyborcern
www.jinr.ru
www.sujv.cz

7.11 The Danube Region Cooperation

The Strategy for the Danube Region is one of the most recent macro-regional strategies in Europe. It was formed in regions of extreme historical and political diversity during a prolonged economic and political crisis. The macro-regional strategy promotes intensive collaboration, particularly in education, research and innovation. The Strategy for the Danube Region is an EU strategy which also involves non-member states in the catchment area of the Danube River. As this area covers more than 800,000 square kilometres with more than 100 million inhabitants, the support for the Strategy has been growing continuously in recent years.

The scope and content of the Strategy for the Danube Region and its Action Plan concern all major fields of natural and social sciences. A coordinated approach to common issues of the Danube Region and adjacent areas based on clarity and communication among all stakeholders leads to effective solutions which unlock the immense potential of the region. The Ministry of Education of the Czech Republic joined the DANUBE-INCO.NET coordination network under its PA7 project. Priority Axis 7 focuses on developing the knowledge society through research, education and utilisation of information technologies. Its ambition is to deliver on the priorities of the Danube Region Strategy.

Coordinators promote collaboration on preparing international projects aimed at improving the quality of life in the region. The steering committee evaluates project proposals which aim to support the development of the knowledge society in the Danube Region. These flagship and pilot projects build on the themes of the H2020 framework programme for research and innovation. The EU Strategy for the Danube Region has the potential to become an extensive European project.

Further information can be found at these addresses:
https://danube-inco.net/
http://www.msmt.cz/mezinarodni-vztahy/makroregionalni-strategie-eu
www.evropskyvyzkum.cz/cs/nastroje-spoluprace/iniciativy-ek/danube

7.12 Other institutions in international cooperation

7.12.1 Central European Initiative

The Central European Initiative (CEI) is a regional cooperation organisation with 18 member states, which supports non-EU members in their integration into the EU. It fosters their transformation and regional cooperation in a number of thematic areas, including research and development. CEI focuses on strengthening cohesion and solidarity in Europe and preventing new dividing lines on the continent.

Further information can be found at this address:
www.ceinet.org

7.12.2 Visegrad Group

The Visegrad Group reflects the effort of the countries of the Central European region to work together in a number of fields of common interest. The cooperation takes place through meetings on many levels. The working group of ministers or deputy ministers (often including the Slovenian Republic as well) convenes on an annual basis in one of the Member States to exchange experience and align policies for participating in EU programmes and projects.
The goals of the fund are achieved through financing provided for relevant projects. Legal or natural persons may only apply for funding for concrete projects. In selecting projects for awarding funding, the fund puts emphasis on those which involve the largest groups of entities from V4 countries. The activity of the fund is made possible by regular contributions from its parties. The fund's budget continues to increase year on year. Most grants reach 70% of the total costs of the project.

Further information can be found at this address:
https://www.visegradfund.org/
http://www.msmt.cz/vyzkum-a-vyvoj-2/visegradska-skupina

7.12.3 Salzburg Forum

The Salzburg Forum is an initiative of ministers of the interior of 9 countries meeting annually in Salzburg, Austria to promote political cooperation. Some discussions to harmonise views of the members also take place during the Competitiveness Council meetings. In the Salzburg Declaration (8/2009), the Member States pledged to maximise the benefits of the European Research Area. Another objective of the Salzburg Forum is to offer expertise and political support to future presidencies of the Salzburg Forum.

Further information can be found at this address:
www.evropskyvyzkum.cz/cs/nastroje-spoluprace/mezinarodni-programy-podpory/salcburska-skupina

7.12.4 Von Kárman Institute for Fluid Dynamics (VKI)

The international association that conducts research and provides education for experts in fluid dynamics was founded in 1956. Its objective was to develop the qualification and skill levels of experts in the construction of aircraft and aircraft propulsion and experts in liquid mechanics. The association also disseminates recent findings in fluid mechanics, and findings from its own theoretical and experimental research into numerical methods in internal and external aerodynamics.

Further information can be found at this address:
www.vki.ac.be

7.12.5 Antarctic Cooperation

Argentina
The Czech implementation bodies of the relevant Agreement are the Ministry of Foreign Affairs and the Ministry of Education, Youth and Sports. On the Argentinian side, this role is filled by the National Antarctic Directorate of the Ministry of Foreign Affairs, International Trade and Worship. The Agreement provides legal framework for both parties to develop cooperation on the Antarctic territory

in the areas of science, technology, logistics and environment protection. The Agreement enables exchange of scientific and technical personnel, participation in joint science programmes, joint use of scientific facilities and research laboratories, and the exchange of scientific information.

Chile
The implementation bodies for the Agreement are the Ministry of Education, Youth and Sports on the Czech side, and the Ministry of Foreign Affairs, working through the Chilean Antarctic Institute, on the Chilean side.

Under the Agreement, the parties pledged to cooperate in the following main areas: preparation of joint scientific and technical projects, exchange of information in areas of common interest, support of education and professional human resource training, and improvement of transport in Antarctic areas.

The parties envisage that the cooperation will develop on the basis of the Agreement primarily in areas such as physics of the atmosphere, cosmic rays, meteorology, geology, geophysics, palaeontology, oceanic and terrestrial ecology, glaciology, biology and medical science, with a focus on uncovering changes of global importance which can be observed in Antarctica, and observation and monitoring of such changes.

LIST OF ACRONYMS AND ABBREVIATIONS

2013 Update to NRDIP	Update to the National Research, Development and Innovation Policy of the Czech Republic for 2009–2015 and Projections until 2020
Act No. 130/2002 Sb.	Act No. 130/2002 Sb., on the support for research, experimental development and innovation from public funds and on changes to certain related acts, as amended
AIE CR	Association of Innovative Entrepreneurship CR
AV CR	Academy of Sciences of the Czech Republic
CEI	Central European Initiative
CEP	Central Register of Research, Experimental Development and Innovation Projects
CEZ	Central Register of Research Plans
CIP	Framework Programme Competitiveness and Innovation 2007 – 2013
COSME	Competitiveness of Enterprises and Small and Medium-sized Enterprises
COST	European Cooperation in Science and Technology
CSF	Czech Science Foundation
CSO	Czech Statistical Office
DFG	Deutsche Forschungsgemeinschaft (German Science Foundation)
EC	European Commission
EC	European Community
ECOP	Education for Competitiveness Operational Programme
EEA	European Economic Area
EICOP	Enterprise and Innovation for Competitiveness Operational Programme 2014–2020
EIOP	Operational Programme Enterprise and Innovation
EIP	Sub-programme Enterprise and Innovation of the EU Framework Programme for Competitiveness and Innovation (CIP)
EIT	European Institute of Innovation and Technology
Eligible expenditure	Expenditure which may be claimed for reimbursement Other expressions: approved expenditure
EMBC	European Molecular Biology Conference
EMBO	European Molecular Biology Organisation
ENO	European Northern Observatory
ERA	European Research Area
ERC	European Research Council
ERCEA	ERC Executive Agency
ERDF	European Regional Development Fund

ESA	European Space Agency
ESF	European Science Foundation or European Social Fund
ESFRI	European Strategy Forum for Research Infrastructures
ESIF	European Structural & Investment Funds
ESO	European Southern Observatory
EU	European Union
EU-28	All 28 EU member states (EU-25 + Bulgaria and Romania/2007/ Croatia /2013/)
Eurostat	European statistical office
FP8	8th Framework Programme of the European Union Horizon 2020
FP9	9th Framework Programme of the European Union Horizon 2020
Framework	Framework for State Aid for Research, Development and Innovation (2014/C 198/01)
GBER	General Block Exemption Regulation, Commission Regulation (EU) 651/2014
GBER	Commission Regulation (EU) 651/2014
GDP	Gross Domestic Product
H2020	Horizon 2020
ICT	Information and Communication Technologies
ID	Identification number
Innovation Strategy	Innovation Strategy of the Czech Republic 2019 -2030
ISOP	Information system of the Operational Programme of the Ministry of Industry and Trade of the Czech Republic
ISTC	International Science and Technology Center in Russia
ITER	International Thermonuclear Experimental Reactor
JAKOP	Operational Programme Jan Amos Komenský
JRC	Joint Research Centre
JTF	Just Transition Fund
JTI	Joint Technology Initiative
JTM	Just Transition Mechanism
JTM	Just Transition Mechanism
LTPRD	Long-Term Principal Research Directions
M17+	Methodology of Evaluation of Research Organisations and Programmes of Specific-Purpose Funding for Research, Development and Innovation
MA	Ministry of Agriculture of the Czech Republic
MC	Ministry of Culture of the Czech Republic
MD	Ministry of Defence of the Czech Republic
ME	Ministry of the Environment of the Czech Republic

MEYS	Ministry of Education, Youth and Sport of the Czech Republic
MFA	Ministry of Foreign Affairs of the Czech Republic
MFF	Multiannual financial framework
MH	Ministry of Health of the Czech Republic
MI	Ministry of the Interior of the Czech Republic
MIT	Ministry of Industry and Trade of the Czech Republic
MLSA	Ministry of Labour and Social Affairs
MRD	Ministry for Research and Development (planned but not established)
MT	Ministry of Transport of the Czech Republic
NICER	National Information Centre for European Research
NINET	National Information Network
NRDIP	National Research, Development and Innovation Policy of the Czech Republic
NRDIP 2016	National Research, Development and Innovation Policy of the Czech Republic for 2016–2020
NRDIP 2021+	National Research, Development and Innovation Policy of the Czech Republic 2021+
NRF	National Research Foundation of Korea
NSC	National Science Council of Taiwan
NUTS-2	Nomenclature of Territorial Units for Statistics Level “2”
OECD	Organisation for Economic Co-operation and Development
OG CR	Office of the Government of the Czech Republic
OP	Operational Programme
PTRDI	Register of Public Tenders in Research, Experimental Development and Innovation
R&D	Research and Development
R&DC	Research and Development Council, R&D Council
RD&I IS	Research, Development and Innovation Information System
RDEOP	Research, Development and Education Operational Programme for 2014–2020
RDI	Research, experimental development and innovation
RDI Analysis	Analysis of the Situation in Research, Development and Innovation in the Czech Republic and Comparison with the Situation Abroad
RDI Priorities	National Priorities of Oriented Research, Experimental Development and Innovation
RDIOP	Research and Development for Innovations Operational Programme

RFCS	Research Fund for Coal and Steel
RIS3	National Research and Innovation Strategy for Smart Specialisation
RIV	Information Register of R&D Results
RO	Research organisation
SB	State budget of the Czech Republic
SME	Small and medium-sized enterprise
SME	Small and medium-sized enterprise
SPS	Science for Peace and Security
STCU	Science and Technology Center in Ukraine
TA CR	Technology Agency of the Czech Republic
TACOP	Technology and Applications for Competitiveness Operational Programme
TC AV	Technology Centre of the Academy of Sciences of the Czech Republic
VAT	Value Added Tax

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