Funding programme for applied research ZETA

1. NAME OF PROGRAMME

Funding programme for applied research ZETA (hereinafter referred to as “programme”).

2. LEGAL FRAMEWORK FOR THE PROGRAMME

The programme will be implemented with regard to:

- Act No. 130/2002, on the support of research, experimental development and innovation from public funds and amending certain related laws (Support of Research and Experimental Development and Innovations Act), as amended;
- Commission regulation (EU) No 651/2014 of 17th June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty - OJ L 187, 26.6.2014 (hereinafter referred to as “Regulation”), esp. articles 25 and 29;
- Communication from the Commission — Framework for State aid for research and development and innovation - OJ C 198, 27th June 2014 (hereinafter referred to as “Framework”);
- and other related laws and regulations.

The programme is exempt from the notification requirement of Article 108(3) of the Treaty on the Functioning of the European Union, as it complies with the conditions of the Regulation.

This programme excludes payments of individual aid to an undertaking against which a non-paid collecting order has been issued in response to a Commission decision declaring the aid illegal and incompatible with the internal market. Aid shall not be granted to undertakings in difficulty as defined in Article 2(18) of the Regulation.

The programme shall be implemented in accordance with the National Policy on Research, Development and Innovation of the Czech Republic for the years 2016 to 2020 with a view to 2025, approved by Government Resolution No. 135 of 17th April 2016, National Priorities of Oriented Research, Experimental Development and Innovations adopted by Government Resolution No. 552 of 19th July 2012 (hereinafter referred to as “Priorities”), and the National Research and Development Strategy for Intelligent Specialisation of the Czech Republic (RIS 3 strategy) adopted by Government Resolution No. 1028 of 8th December 2014.

3. PROVIDER

The funding is to be provided by the Technology Agency of the Czech Republic (hereinafter referred to as “TA CR”) based in Prague.

4. PROGRAMME IDENTIFICATION CODE

The information system for research, experimental development and innovations registers the programme under the code “TJ”.

5. DURATION AND DATE OF ANNOUNCEMENT

The programme is supposed to run from 2017 till 2025, i.e. for a period of 9 years.

The public call for proposals in applied research and experimental development and innovations (hereinafter referred to as “public tender”) for selecting projects eligible for the programme shall first be open in 2016 and the funding shall first be distributed in 2017. Subsequent public tenders shall be announced every year from 2017 till 2021, with the aid starting in 2018 through 2022.

In the period of 2024-2025, evaluation activities shall be performed after accomplishing all projects including the application of the results. Therefore, no public funds are requested for 2024-2025.

The minimum duration of projects under this programme is 12 months, 24 months at the maximum.

6. PROGRAMME FOCUS

The programme is aimed at supporting cooperation between universities and businesses through the involvement of students of Master's and Doctoral Study Programmes ("students") and young researchers ("young researchers") aged 35 or younger[1]. The programme shall support projects falling, pursuant to Article 25(2)(b) and (c) of the Regulation and Article 1(3)(e) of the Framework, in the category of applied research (it includes industrial research, experimental development or a combination thereof).
The programme shall be available within the ERA NET COFUND scheme or the Marie Sklodowska Curie Actions COFUND Horizon 2020, for projects in areas complying with the focus of the programme.

7. OBJECTIVES OF THE PROGRAMME

The aim of the programme is to involve students and young researchers in research and development activities aimed at putting the results in practice, increase the interest of students and young researchers in projects with a specific practical impact and support such projects in the academic sphere in general, in relation to the economy. A secondary objective is to support the equalization of opportunities for young researchers - women and men - to address applied research projects funded under this programme. The objectives of the programme corresponding to individual priority areas are set out in the Annex (Chapter 22).

8. JUSTIFICATION OF THE OBJECTIVES OF THE PROGRAMME

Aid from the programme shall be routed where market failure occurs. In this case, it is about eliminating market failures where there is generally insufficient use of applied research results in the application sphere. Programme interventions shall focus on real cooperation of young researchers in solving specific research projects with entities established in all areas of applied research. For example, it is desirable that students focus their closing theses on practical topics whose conclusions and outputs can be further developed and used in applications. However, it is also about removing the unequal position of students and young researchers who are disadvantaged when submitting project proposals by not having the relevant experience, publication and other results compared to their senior colleagues. The programme's sub-target responds to the fact that in 2012, there women represent merely 27.5% of researchers in the Czech Republic (only 24.7% of researchers when recalculated to full-time employments)[2]. These measures adequately follow up on the NP for R&D&I, which, among other things, requires the creation of conditions for a greater representation of women in research, the involvement of university students in R&D and an increased participation of graduates from master and doctoral studies in innovative SMEs. The programme further concerns:

- Motivation during university studies to solve projects that are linked to the real needs of the application sector in the Czech Republic;
- Enabling students and young researchers to concentrate fully on their professional work - it has been a common phenomenon that graduating and postgraduate students need to take, for financial reasons, irrelevant jobs, which in turn reduces the quality of their work and study;
- The involvement of university departments and institutes themselves in projects linked to the real needs of the application sector, thus gradually removing barriers between application and research organisations, which is now recognized as one of the real problems (in relation to market failures);
- Achieving such results of the research that would help increase innovation and competitiveness in the Czech Republic;
- Setting such conditions for applicants and beneficiaries that shall result in equal opportunities for men and women in applied research.

This programme is complementary to the activities funded under Specific Objective 2.5. of the Research, Development, Education Operational Programme which focuses on mobility from the business sector to research organisations and on international mobility. At the same time, it is

[1] This age limit means reaching the age of 35 years. If a student or young researcher has been on maternity or parental leave or has cared for minors, has a long-term illness, etc., the age limit shall be increased by this period (i.e. it can be added to the 35-year limit).
[2] Source: CSU, Research and Development Indicators

complementary to the activities funded by the Enterprise and Innovation for Competitiveness Operational Programme, which, within the Knowledge Transfer Partnerships programme, aims to support the mobility of graduates into companies. The ZETA programme thus fills the gap in supporting students and young scientists doing scientific work in a research organisation, who need an application sector, i.e. a company, for this job. The idea is then to enhance the mobility of students and young scientists to businesses.

9. TOTAL EXPENDITURE ON THE PROGRAMME

The total expenditure on the programme is scheduled for the duration of the programme in accordance with the planned progression of announcements of individual tenders.

Table 9.1: Programme budget [mil. CZK]

YEAR	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
Total expenditure	70 600	141 200	141 200	141 200	141 200	141 200	70 600	847 200
Public funds	60 000	120 000	120 000	120 000	120 000	120 000	60 000	720 000
Non-public resources	10 600	21 200	21 200	21 200	21 200	21 200	10 600	127 200

10. FORM, LEVEL AND AMOUNT OF SUPPORT

The aid intensity, as a percentage of the project's eligible costs, shall be calculated for each project and **for each beneficiary** and for **each other participant** separately pursuant to the Regulation and shall not exceed the maximum allowable aid intensity specified in the Regulation.

The maximum permissible aid intensity per project is 85% of the total eligible costs.

In compliance with the Regulation, it is possible to provide bonuses for fulfilling the conditions of effective collaboration under Article 25(6)(b)(i). Applicants will be required to participate in the financing of the costs.

The maximum amount of financial support spent per project is limited to CZK 5 million.

The maximum allowable aid intensity rates for industrial research and experimental development and individual categories of participants are listed in the following table:

Table 10.1: Maximum allowable funding intensity rates for industrial research and experimental development categories of participants

Participant	Industrial research		Experimental development	
	Maximum allowable funding intensity, incl. bonuses for small and medium-sized enterprises	Maximum allowable funding intensity with demonstrated effective collaboration with a research organisation	Maximum allowable funding intensity, incl. bonuses for small and medium-sized enterprises	Maximum allowable funding intensity with demonstrated effective collaboration with a research organisation
Small enterprises*	70%	80%	45%	60%
Medium-sized enterprises*	60%	75%	35%	50%
Large enterprises*	50%	65%	25%	40%
Research** organisations	100%[1)]	100%[1)]	100%[1)]	100%[1)]

* Note: An SME is defined in Annex 1 of the Regulation.

** The indicated funding intensity refers to research organisations' non-economic activities.
[1)] Whilst respecting the maximum permissible funding intensity per project to be set individually for each public tender.
Source: Regulation

11. BENEFICIARIES OF THE FUNDING

Eligible beneficiaries of funding for projects pursuant to the Support of Research and Experimental Development and Innovations Act and the Regulation:

Research and knowledge dissemination organisations (hereinafter referred to as "research organisations") - entities that meet the definition of research organisation pursuant to Article 2(83) of the Regulation and which manage the project alone or in collaboration with other participants, demonstrate the ability to co-finance the project from non-public sources; in exceptional and properly justified cases defined in the specification of the tender, projects co-financed from other public sources may be admissible.

Businesses - legal and natural persons who, according to Annex 1 of the Regulation, are engaged in an economic activity and carry out the project alone or in collaboration with other participants and demonstrate the ability to co-finance the project from non-public sources.

Assessing whether an applicant fulfils the defining parameters of a research organisation under the Regulation shall be performed by the provider on an individual basis for each project applicant during initial project evaluation and after completion. Compliance with the definition of a research organisation according to the Regulation shall be verified against the statutes, the constitution or foundation charter of the candidate or other participant, proof of separate accounting for economic and non-economic activities and verification of the absence of priority access to results or research capacities (not only in relation to the project in question).

12. CONDITIONS FOR FUNDING DISTRIBUTION

- The research team consists of a minimum of four members (i.e. three students or young researchers and one mentor).
- The members of the team shall be employees of the applicant or to become so once the funding has been granted.
- The leader of the research team may be only a student or a young researcher who, as at the application deadline, reaches the age of 35 or less. The tender documentation shall set out conditions to prevent discrimination against persons on maternity or parental leave, persons caring for minors, persons who have suffered a long-term illness, etc.
- Only students or young researchers aged 35 or less as at the application deadline can become members of the team. The tender specification for the relevant tender shall contain the conditions to prevent discrimination against persons on maternity or parental leave, persons caring for minors, persons who have suffered a long-term illness, etc.
- The research team shall include a person (mentor) aged over 35 and possessing relevant experience from the academic and/or application sector.
- Beneficiaries shall be required to demonstrate co-operation in project management with an application partner or a foreign institution with a sophisticated system of commercialization, as specified in the tender dossier.

13. ELIGIBILITY OF APPLICANTS

Only those applicants who meet the eligibility conditions set out in Section 18 of the Support of Research and Experimental Development and Innovations Act can obtain aid for a project implemented under the programme. If more than one applicant are involved in one project, eligibility must be proven for all of them. Eligibility shall be substantiated by the applicant in accordance with the Support of Research and Experimental Development and Innovations Act, as determined by the Provider in the public tender specification.

14. ELIGIBLE AND RECOGNIZED COSTS

The funding will be granted against the eligible costs of the project, i.e. the eligible costs which the

provider approves and which are justified. The applicant may suggest costs defined in accordance with the Support of Research and Experimental Development and Innovations Act and the Regulation. Pursuant to Regulation Article 25(3), the eligible costs of research and development projects shall be allocated to a specific category of research and development and shall be the following in this programme:

a) personnel costs: researchers, technicians and other supporting staff to the extent employed on the project;

b) costs of instruments and equipment to the extent and for the period used for the project. Where such instruments and equipment are not used for their full life for the project, only the depreciation costs corresponding to the life of the project, as calculated on the basis of generally accepted accounting principles are considered as eligible.

c) Costs of contractual research, knowledge and patents bought or licensed from outside sources at arm's length conditions, as well as costs of consultancy and equivalent services used exclusively for the project;

d) additional overheads and other operating expenses, including costs of materials, supplies and similar products, incurred directly as a result of the project.

A more detailed specification of the eligible costs shall be part of the tender specification for the relevant public tender.

15. COMPARISON OF THE CURRENT SITUATION IN THE CZECH REPUBLIC AND ABROAD

In the Czech Republic, co-operation in applied research and development between research organisations and the application sphere is supported, for example, in TA CR programmes where most of the supported projects are implemented in cooperation between entities from both the research and application sectors. The aspect of involving young researchers is in turn accentuated in a group of grants sponsored by the Grant Agency of the Czech Republic (GA CR) called “Junior Grants”, which was approved by Government Resolution No. 694 of 11 September 2013 and the first public tender was announced in 2014; this group of grant projects focuses, however, on basic research projects. It was proposed based on the experience with the “Starting Grants” programme of the European Research Council (ERC). The “Junior Grants” of the GA CR should lead to the creation of new scientific groups led by young scientists and the duration of grant solutions is set at 36 months. The condition for the group leader is the age of 35 years at the time of submitting the project proposal (this also applies to other team members), a maximum period of 8 years since acquiring their Ph.D., a minimum of 6 months of internship abroad and proof of excellence (e.g. publications in recognized international journals). Maternity or parental leave does not count for age.

As an example of subsidy instruments generally aimed at the collaboration of (academic) research and businesses in innovative countries of the EU, there is the Zentrales Innovationsprogramm Mittelstand (ZIM/KOOP KF/VP) or the British Industrial Partnership Awards (IPAs) and Collaborative R&D Programmes (CR&D). These programmes differ in many parameters - such as the limitation or non-limitation of the range of supported technology disciplines, the involvement of a business partner (public funds are acquired only by the academic entity and the enterprise adds a minimum fixed share of the costs or other resources; public funds sometimes also go to participating enterprises); there can be a time limit or no limit for the submission of applications; programmes also differ by evaluation procedures (e.g. collaboration projects would be preferred to standard ones at the same agency); the selection of partners can be left at the discretion of applicants (with CR&D, the provider’s web helps to find suitable partners, though), and so on. Common features, on the other hand, include a stronger emphasis on the commercial potential of the expected results and the formal contracting of management and the distribution of intellectual property rights to the expected results of the project among the partners.

Abroad, grants are also awarded to students working part-time on research projects for businesses using their facilities, thus supporting their employability after graduation, while strengthening the relationship between the business sector and the universities. The following programmes can be used as examples for post-graduate students: Industrial Thesis Support Programme (Turkey), ErhvervsPHD-ordningen (Industrial PhD Programme) (Denmark), Industrial CASE Competitions (UK), Naerings PhD (Norway), Industrial Postgraduate Programmes (Singapore). Funds are not claimed by individual students, but by their colleges, which monitor projects in the companies (whose payroll costs can be covered, for example). Similarly to the support of the corporate and academic research in general, graduate and post-graduate programmes also put emphasis on the rights to potential

outcomes of the projects.
There are programmes running without the role of universities as intermediaries, aimed at various levels of study (graduate, post-graduate or even higher), in countries like Canada, the US or the UK: Industrial R&D Internship Programme, Virginia Commonwealth STEM Industry Internship Program, Research Experience Placement & Professional Internships For PhD Students. Internships in corporate R&D departments can be as short as 3 months (over summer holidays), but they are paid for students, and students get practical experience or even find a future employer. It is however the company who selects the student for the position, not the college. There are also programmes supporting young talented scientists/researchers without linking to businesses.
Among the examples found abroad, there are also programmes specifically aimed at supporting scientists to gain independence and focus on their own topics of research (similarly to GA CR's "Junior Grants"), such as: Starting Investigator Research Grant (Ireland), Starting Grants (Switzerland) First Grant Scheme, New Investigator Scheme of Biotechnology and Biological Sciences Research Council or New Investigator Research Scheme of Medical Research Council (all three in the United Kingdom), New Investigator Grant (Singapore).
In addition to the national programmes of individual countries, the ZETA programme has also been based on information/experience related to supporting young researchers and gender balance in EU programmes. A good example would be Horizon 2020, which seeks to incorporate the gender dimension into its programmes and projects at several levels - in particular:

- In the calls for proposals, candidates should be asked, among other things, to describe how gender and gender issues are taken into account in their planned research, and for some calls for proposals, the gender dimension of the project proposal shall be evaluated as an integral part of the planned research;
- At the level of research teams, a balanced representation of women and men is encouraged by the fact that it is one of the factors for ranking the projects in case of parity;
- The objective of a balanced representation is also monitored in the programme's advisory groups (at least 40% of either gender), while each group should include at least one gender expert.

16. INCENTIVE EFFECT

As a provider and in order to meet the objectives of the Programme and the conditions of the Regulation, TA CR shall assess the presence of the incentive effect of the aid under Article 6 of the Regulation as part of the initial evaluation of projects. The beneficiary shall submit a written application for the funding before work on the project or activity starts. The application for the funding must comply with the requirements of Article 6(2) of the Regulation. All recipients must submit a project proposal before starting work.

17. EXPECTED RESULTS OF THE PROGRAMME

Only projects that can be expected to accomplish at least one of the following types of results (categorization according to the result information register) can be supported under this programme:

G - technically realized results - prototype, functional sample;
Z - pilot plant, proven technology;
R - software;
F - industrial and utility model;
N - Certified methodologies, procedures and specialized maps with professional content;
H_{leg} - results reflected in legislation and standards;
H_{neleg} - results reflected in non-legislative directives and provisions binding within the competence of the respective body;
V_{souhrn} - Comprehensive Research Report
O - Miscellaneous.

However, due to the specific focus of the programme, there is a whole range of **knowledge and skills in accordance with section 2(2)(k)** of the Support of Research and Experimental Development and Innovations Act, which are expected to be the results of public tenders. For this reason, the programme shall be evaluated not only on the basis of outputs according to the current Methodology for evaluating the results of the research organisations and the results of the completed programmes, but also on the knowledge and skills acquired, as specified during the preparation of this type of research project.

18. EXPECTED BENEFITS OF THE PROGRAM

The expected benefits of the programme include:

- Motivation to solve applied research projects that are linked to the real needs of the application sphere in the Czech Republic in the framework of master's and doctoral studies and among young researchers.
- Enabling maximum concentration of students and young researchers on professional work.
- Achieving such results of applied research that would help increase the competitiveness of the Czech Republic.
- Better use of the potential of future and beginning young researchers.
- Promoting non-discriminatory and balanced opportunities for men and women in applied research in the academic sphere (research organisations) and the sphere of application,
- Promoting collaboration between the academic sphere (research organisations) and the application sphere.

19. METHODOLOGY AND CRITERIA FOR THE EVALUATION OF PROJECT PROPOSALS

The project proposals shall be comprehensively evaluated by the TA CR in accordance with the Support of Research and Experimental Development and Innovations Act. In order to evaluate the project proposals applying for the public tender, the TA CR shall establish a specialized advisory body. Each project proposal shall be evaluated by at least two independent evaluators. The evaluation criteria shall focus primarily on the involvement of students and young researchers in practice and on the extent to which the Priorities are met.

Evaluation Criteria

- Compliance with the conditions of the tender,
- Usefulness of the project,
- The expected benefit and quality of the project outcome,
- The feasibility of the project and its implementation procedure.

More details on the evaluation of project proposals, scoring and the threshold values for individual evaluation criteria are set out in the relevant tender dossier. The evaluation of project proposals shall specify non-discriminatory and balanced opportunities for men and women (e.g. gender balance in the composition of the expert advisory body and opponents, gender-anonymous evaluation, etc.).

20. EXPECTED PARAMETERS OF THE PROGRAMME

In relation to the focus of the programme, the average amount of support per project is expected to be CZK 2 million. With regard to the overall programme budget, at least 140 supported projects are foreseen.

21. CRITERIA FOR COMPLIANCE WITH THE PROGRAMME OBJECTIVES

The achievement of the objectives of the programme shall be evaluated in accordance with the Methodology for evaluating the results of the research organisations and the results of the completed programmes valid at the time of evaluation of the programme, or the conditions set by the provider. Achieving the objectives of the programme shall be evaluated on the basis of a set of indicators designed to monitor the progress of programme implementation and to evaluate its overall performance and success. The selection and setting of indicators shall also respect the requirement to ensure and monitor the incentive effect of the aid in compliance with the Regulation. Indicators are categorized by their nature.

Table 1: Structure of the priority area Competitive knowledge-based economy

Priority area	Subarea	R&D Targets
1. Application of new findings from the area of General Purpose Technologies	1.1 GPTs for innovations of processes, products and services	1.1.1 To gain new utility values of the products by using new findings from area of GPTs
		1.1.2 To improve efficiency, safety, sustainability and reliability of processes (including lowering of energy intensity and costs of material) by using GPTs
		1.1.3 To streamline offered services and processes in direct services by using GPTs
		1.1.4 To streamline offered services and processes in the public sector by using GPTs
2. Strengthening of sustainability of production and other economic activities	2.1 Economy, efficiency and adaptability	2.1.1 To increase economy, efficiency and adaptability in transport - transport and handling systems and vehicles production to make these areas globally competitive
		2.1.2 To improve economy, efficiency and adaptability in industries to empower global competitiveness in this area
		2.1.3 To improve economy, efficiency and adaptability in electrical engineering, including IT industry and services to empower global competitiveness in this area
		2.1.4 To improve adaptability of products by cross departmental research
	2.2 Use values of products and services	2.2.1 To innovate products in the branches important for export by joint activities of manufacturing and research areas
		2.2.2 To improve competitiveness of products and services by improving their use values
3. Strengthening of safety and reliability	3.1 Safety and reliability of products and services	3.1.1 To establish complex policy to safety and reliability of products and services

		3.1.2 To improve reliability and safety of network systems by development and introduction of smart networks
	3.2 Safety and reliability of processes	3.2.1 To gain permanently high degree of the data protection and communication security in a dynamically changing environment
		3.2.2 To increase use and quality of autopilots and automation
		3.2.3 To increase quality of process monitoring and early warning systems
		3.2.4 To increase security and reliability of processes by using simulator and virtual reality means to gain significant reduction of both direct and indirect costs caused by their failures
4. Mapping and analysis of competitive advantages	4.1 Identification of the new opportunities of competitive advantage	4.1.1 Actual identification of the economic opportunity by the continuous global trends monitoring and scoring

Table 2: Structure of the priority area Sustainability of energetics and material resources

Priority area	Subarea	R&D Targets
1. Sustainable energetics	1.1 Renewable resources of the energy	1.1.1 Development of the economically efficient solar energetics
		1.1.2 Development of the economically efficient geothermal energetics
		1.1.3 Development of the economically efficient use of the biomass
	1.2 Nuclear resources of the energy	1.2.1 Efficient long-term use of nowadays nuclear power plants
		1.2.2 Support of the security of the nuclear facilities
		1.2.3 Research ensuring support of the construction and running of the new economically efficient and secure blocks

		1.2.4 Research and development of the fuel cycle
		1.2.5 Deposition of the nuclear waste and used combustibles
		1.2.6 Research and development in the area of reactor of the IV generation, mostly effective and secure fast reactors
	1.3 Fossil resources of the energy	1.3.1 Economically efficient and ecological fossil energetics and heating industry
	1.4 Power lines including power accumulation	1.4.1 Capacity, reliability and safety of the spinal power lines
		1.4.2 Modification of the lines for the „demand-side management“
		1.4.3 Power accumulation including use of the hydro energy
		1.4.4 Safety and durability of the power lines
	1.5 Production and distribution of the heat / coldness including cogeneration and trigeneration	1.5.1 Heat withdrawal from power stations in the basic load
		1.5.2 Effective cogeneration (trigeneration) in SCZT sources in works with partial load (system services)
		1.5.3 Distributed combined production of the energy, heat and coldness from every kind of resources
		1.5.4 Transport and accumulation of the heat
		1.5.5 Efficient management of the modification of the indoor environs
		1.5.6 Alternative resources - exploitation of wastes
	1.6 Energy in the transport	1.6.1 To increase the quotient of the agro fuel as a compensation for the fossil sources
		1.6.2 To increase the quotient of the use of the

		electric energy in the transport as a compensation for fossil sources
		1.6.3 To establish in the perspective the use of hydrogen as a transport power source
	1.7 System development of the Czech energetics in the context of the development of the EU energetics	1.7.1 System analysis for the support of the balanced state energetics conception (SEC), another related strategic documents of the state and regional developing concepts considering the EU frame
		1.7.2 Integral conception of the development of the municipalities and regions with the verification with the demo projects (linked to the SET Plan –Smart Cities and Smart Regions)
2. Lowering the energetic demands of the economy	2.1 Lowering the energetic demands of the economy	2.1.1 Energy budget of the materials and fuels for the whole stroke
		2.1.2 Research and development of the new energy saving industrial technologies
		2.1.3 Increases in the use values and durability of the buildings
	2.2 New technologies and processes with a potential utilisation in the economy	2.2.1 Participation of the R&D in the international activities in the area of the utilisation of the nuclear fusion
		2.2.2 New methods and procedures in the area of the diagnostic to increase the reliability, security and durability of the energy devices
		2.2.3 Biotechnology, bioengineering and genetics
3. Material base	3.1 Advanced materials	3.1.1 Long-term perspective of the provision of the raw materials for the economy of the Czech Republic

		3.1.2 Advanced materials for the competitiveness
		3.1.3 Innovation and sustainability of the classical materials
		3.1.4 Use of the nanomaterials and nanotechnologies

Table 3: Structure of the priority area Environment for quality life

Priority area	Subarea	R&D Targets
1. Natural resources	1.1 Biodiversity	1.1.1 Increase of the long-term efficiency of the particular territorial natural and landscape preservation leading to the support of the metapopulations of decreasing threatened species and species with the focal point of occurrence in the biotopes created or strongly influenced by humans
		1.1.2 Formation of the efficient kinds of measures to maintain natural associations and natural biotopes of species
		1.1.3 Valuation of the impact of the plant and animal invasions and development of the instruments for their limitation
		1.1.4 Valuation, survey and categorization of ecosystem services including creation of the instruments for valuation of their fact accuracy and practical utility
	1.2 Water	1.2.1 Reduction of the water pollution from point and non-point sources and the sustainable use of the water resources
	1.3 Soil	1.3.1 Increase of the content of the stable organic mass and the support of functional diversity of soil organisms with collateral maintenance of the productivity character of soil

		1.3.3 Increase of the retention ability of the wetland soil and implementing of the retention zones
	1.4 Air	1.4.1 Limitation of the emissions of polluting substances from anthropogenic sources
		1.4.2 Gadgetry of the spread and deposition of the polluting substances
	1.5 Mineral deposits and effects of mining on the environment	1.5.1 Enforcement of the sustainability of the procurement with mineral primary commodities
2. Global changes	2.1 Methods of mitigation and adaptation for global and local changes	2.1.1 Proposition of the adaptive measures in the particular sector of the economy of the Czech Republic and proposition of the instruments for GHG emissions lowering
	2.2 Biogeochemical cycles of nitrogen and phosphor	2.2.1 Optimisation of the streams of the reactive forms of nitrogen and phosphor (Nr a Pr)
	2.3 Dangerous substances in the natural environment	2.3.1 Natural environment and health
3. Sustainable development of landscape and settlements	3.1 Green infrastructure - stable structure of the landscape	3.1.1 Creation of the conceptual instruments of the landscape planning
	3.2 Agriculture and forestry	3.2.1 Acquirement of practically useful information for effective agricultural production in the ecologically and economically long-term sustainable
	3.3 Urbanism and intelligent human settlements	3.3.1 Design of modern methods and systems of construction and keeping of the intelligent human settlements with minimum impacts on the environment
4.Environmental technologies and eco-innovations	4.1 Environment-friendly technologies, techniques and materials	4.1.1 Technologies and products increasing complex efficiency of the exploitation of primary sources
	4.2 Biotechnology, material, energetic and emissive efficient technologies,	4.2.1 To gain qualitatively new primal product by using biotechnological methods

	products and services	4.2.2 To prepare biotechnological methods for the complex wasteless use of the biomass
	4.3 Minimisation of the waste production and their re-use	4.3.1 New recycling technologies - their output being substances with comparable quality to the input raw materials
		4.3.2 New effective methods of energetic use of wastes with a minimisation of the negative environmental influences
	4.4 Removing of the dangerous substances - old damages from the environment	4.4.1 Increase of the efficiency of the redevelopment technologies and introduce of the new methods of redevelopment
	4.5 Minimisation of the chemical substances risk	4.5.1 Technology for the minimisation of the risks of the POPs, toxic metals, hormonal disruptors, pharmaceutical residuals, pesticides and another pollutants for the human health and
		4.5.2 Technologies for replacement of the risk substances under the REACH legislation and replacement of the dangerous substances by less harmful
5. Environment-friendly society	5.1 Patterns of consumption of the population	5.1.1 To develop efficient methods for the change of patterns of consumption in the direction of minimisation of the effects of consumption on the stabile function of natural resources and eco-system services
	5.2 Measures of the environment-friendly growth	5.2.1 To design innovative instruments of the environmental preservation with the target of minimisation of the costs of their functioning

Table 4: Structure of the priority area Social and cultural challenges

Priority area	Subarea	R&D Targets
1. Demographic and social changes	1.1 Demographic ageing, family policy	1.1.1 Implementation of complex support of active ageing
		1.1.2 Improvement of reproduction potential of the population by improving the value of family in society and improving the efficiency of fertility support
		1.1.3 Prediction and evaluation of impacts of significant population fluctuations and territorial inequalities
	1.2 Marginalization and integration of socially disadvantaged groups	1.2.1 Prevention of deprivation, exclusion and segregation
		1.2.2. Lessening of the impact and depth of exclusion, marginalization and stigmatization
	1.3 Social inequalities, cohesion and social state	1.3.1 Improvement of the equality of conditions in access to education and labour market, housing, social security and services
	1.4 Migration, mobility and territorial cohesion	1.4.1 Efficient use of migration potential
		1.4.2 Improvement of territorial cohesion
2. Government and administration	2.1 Citizen, state and society	2.1.1 Legitimate political system
		2.1.2 Legitimate legal system
		2.1.3 Legitimate socio-economic system
	2.2 Public policies and administration	2.2.1 Functional and efficient public policies and environment
3. Culture, values, identity and tradition	3.1 Changes in value structures and ethics	3.1.1 Changes in basic ethical principles of life in society
		3.1.2 Philosophic and sociologic reflection of the media influence on the change of human life and forming of society
	3.2 National, regional and local identity and tradition	3.2.1 Knowledge of history as a prerequisite of keeping a

		national, regional and local identity, memory and tradition in a national context
		3.2.2 Research of language and literature as a tool for maintaining
		3.2.3 Creative historical and theoretic reflection of artistic work
	3.3 Material and immaterial cultural heritage	3.3.1 Active protection of the cultural heritage
		3.3.2 Reception of cultural heritage as a tool of national self-awareness and state representation
	3.4. Religion	3.4.1 Reflection of the role of religion in current Czech society in a global context
4.Development and use of human potential	4.1 Education, upbringing, lifelong education	4.1.1 Set new educational goals
		4.1.2 Establish a fully functional system of lifelong education
	4.2 Labour market and employment policy	4.2.1 Employment policy increasing the competences of the workforce and increasing the absorption capacity of the labour market
	4.3 Protection and support of human health	4.3.1 Efficient functioning of the cross-departmental system of protection and support of the health of the population
5. Man, science and newtechnologie	5.1 Possibilities and conditions for the development of research, development and innovations	5.1.1 Analysis of the effect of knowledge in the Czech social system
	5.2 Adaptability of man and society to new technologies	5.2.1 Adaptation to new technologies

Table 5: Structure of the priority area Healthy population

Priority area	Subarea	R&D Targets
1. Origin and development of diseases	1.2 Circulatory system diseases	1.2.2. Development of early diagnostics of cardiovascular and cerebrovascular diseases and discovery of therapeutic modalities and processes in therapy of cardiovascular and cerebrovascular diseases with higher therapeutic efficiency and which is also more patient-friendly
	1.4 Neural and psychic diseases	1.4.2 Diagnostic of neural system
		1.4.3 Improved efficiency of treatment methods of neural system diseases
		1.4.4 Ensuring the quality of life of patients with neural system diseases
2. New diagnostic and therapeutic methods	2.1 In vitro diagnostics	2.1.1 Deepening of the knowledge in the area of –omic and high capacity methods
		2.1.2 New IVD technologies
	2.4 Drug delivery systems	2.4.1. Development of new carriers for directed administration and transportation of drugs
	2.5 Genetic, cellular therapy and tissue replacements	2.5.3 Biomaterials
	2.6 Development of new medical instruments	2.6.1 Electric and magnetic mapping
		2.6.2 Endovascular procedures
		2.6.3 Navigational and robotic system, neurostimulants. Improved accuracy and supervision of invasive techniques