LONG-TERM PLAN
OF THE STATE SCIENCE AND TECHNOLOGY POLICY
BY THE YEAR 2015

1. INTRODUCTION

The Slovak Republic as a member state of the European Union (hereinafter referred to as the "EU") has joined the efforts of the EU Member States to coordinate their state science and technology policies in line with the European Research Area policy the aims and priorities of which have been laid down in the Lisbon Strategy. Alongside with contributing to the implementation of the requirements of the European Research Area, the state science and technology policy of the Slovak Republic implements requirements of its own (for the period by 2010 specified in the Statement of Policy of the Government of the Slovak Republic) which is to ensure the economic and social prosperity. The state science and technology policy of the Slovak Republic, taking into account these two basic aspects, thus contributes not only to the development of a knowledge society of its own country, which is the basic pillar of the overall development of each country, but ultimately to the effort of the EU, which is to increase competitiveness vis-à-vis the Unites States and Japan.

2. MAIN OBJECTIVES OF THE STATE SCIENCE AND TECHNOLOGY POLICY BY THE YEAR 2015

To create conditions for the development of science and technology and more expeditious introduction of the results of research and development in practice requires to take a number of measures throughout the system of Slovak science and technology that will take account of the specifics of their domestic development on the one hand, and the objectives and aims of the Lisbon Strategy in the area of science and technology, on the other. The relevant objectives and aims of the long-term plan will be harmonised and interlinked so as to enable science and technology to respond flexibly to the internal (national) and external (international) demands. Their implementation will be continuously monitored, the progress assessed and subsequently they will be updated enabling science and technology to meet the expected mission to be inseparable component of the economic and social development of Slovakia and make a contribution to increasing competitiveness of the Community.

Science and technology as one of the tree pillars of the development of a knowledge based society: ***education – science and technology – innovation*** **must by at the centre of the attention of political and government bodies taking decision of the overall directions of the development of the Slovak Republic, so as to play the role of the decisive development factor for the country.** To this end, the state science and technology policy must set itself such objectives for the development and application of the system of science and technology whose achievement will ensure the expected role of the development factor. **For this reason the main objectives of the state science and technology policy by the year 2015 shall include:**

- **increasing the involvement of science and technology in the overall development of the Slovak Republic – a more intense involvement of science and technology in addressing the economic and social problems of Slovakia.** The increased involvement of science and technology in the country's development will entail increased contribution of Slovakia to the overall improvement of the competitiveness of the EU.

- in order to increase the involvement of science and technology in the overall development of Slovakia, **it is vital to create such conditions for their development and exploitation** that will take into account the specifics of their development in Slovakia on the one hand, and the objectives and aims of building the European Research Area on the other. On the whole, the conditions for the functioning of the system of science and technology must be harmonised and interlinked in such a way as to allow science and technology to respond flexibly not only to the internal (national) but also to external (international) demands.

- **ensure conditions for the development and exploitation of science and technology by setting the objectives for the following areas**:
  a) coordination of science and technology,
  b) the infrastructure of research and development,
  c) systemic priorities of research and development,
  d) substantive priorities of research and development ,
  e) support for science and technology,
  f) the framework organisation model of financing for science and technology in the Slovak Republic by the year 2015,
  g) international scientific and technological cooperation,
  h) evaluation of research and development,
  i) popularisation of science and technology,
  j) monitoring of the state science and technology policy.

3. COORDINATION OF SCIENCE AND TECHNOLOGY BY THE YEAR 2015

The efforts of the EU to increase efficiency of the synergic effect of all tools (financial, social, personnel, information, etc.) that shape the environment in which the system of science and technology operates, at all national levels, lead to the attempt to coordinate national science and technology policies in all countries of the EU. This requires and will require in the future coordinating the science and technology processes, vertically and horizontally, in every EU country.

In the vertical plane, Slovakia will have to improve (see the scheme in Annex 1) the mutual cooperation of the ministries, central bodies of state administration of the Slovak Republic (hereinafter referred to as "central authority") and regional self-government authorities with the organisations of research and development and the subscribers and users of the results of research and development. It will be necessary to improve cooperation particularly between regional self-government authorities and research and development institutions and consumers of their results operating in the relevant region.

In the horizontal plane of ministries and other central authorities it will be necessary to improve cooperation between the Ministry of Education of the Slovak Republic (hereinafter referred to as "Ministry of Education"), ministries, other central authorities and branch associations of industry (see Annex 1), with a view to ensuring conditions for using science and technology as the basic instruments of development in every economic and social sector. **The upgrading and improving of this cooperation must be reflected also the development of sectoral concepts of** the directions and support of research and development (including the concept of the directions and support of research and development in universities and the concept of the directions and support of research and development in the Slovak Academy of Sciences), which the relevant ministries, central

authorities and the Slovak Academy of Science will develop, elaborating on the objectives and aims of the long-term plan, for their respective conditions in medium term under the coordination of the Ministry of Education.

By restructuring the existing positions in the ministries and other central authorities an optimal number of civil service positions will be created for erudite management in the area of science and technology, which within their work duties will deal only with the performance of sectoral competencies in the area of state science and technology policy and the coordination of activities in the area of science and technology. The implementation of the objectives of the European Research Area will require every Member State of the EU to coordinate its state science and technology policy with that of the EU, joint collection and exchange of information, identification of common objectives and regular assessment of the implementation of objectives for every state policy. Hence ministries and other central authorities will need sufficient number of civil service positions for a diligent implementation of these tasks. This objective is all the more important when considering the task of the ministries and central authorities to improve their mutual cooperation and pursue a coherent approach in the implementation of the objectives of the state science and technology policy and the sectoral policies.

The hitherto coordination of the contribution of science and technology to regional development is inadequate and not every regional authority accords this problem equal attention. In order to ensure regional development by means of science and technology it will be necessary, **within the regional development policy, or the regional innovation strategy, to set the objectives and aims for the development and application of science and technology in the region. The implementation of these objectives and aims will call for inclusion of the corresponding activities under the activities of one of the units of self-governing regions' offices.**

Every EU Member State is required through its ministries and central authorities to involve research and development experts, representatives of the economic sphere (industrial and agricultural) and cultural and social life early on in the drafting of essential conceptual materials relating to science and technology. By so doing it is hoped that mutual interlinking of the aims and objectives in the area of science and technology with the needs of the user practice will be improved. However the cooperation of the ministries and central authorities with the experts of the cited areas will not be restricted to the area of developing conceptual materials only but will extended to decision making of the ministries and central authorities, monitoring of the implementation of objectives of the state science and technology policy and its updating. The **Council of the Government of the Slovak Republic for Science and Technology** (hereinafter referred to as the "Government Council") has a particularly important position in involving the experts and representatives of economic and social practice in the decision making of the Government of the Slovak Republic for the area of science and technology in Slovakia. **The Government Council** is an advisory body of the Government of the Slovak Republic in the area of science and technology policies and in order to improve the links of science and technology with innovations it is vital that **it become an advisory body of the Government for the area of innovation policy.** To achieve this, new Government Council will be created constituted in cooperation with the representatives of all institutions having competencies in the area of science, technology and innovations.

The Committee for Knowledge-based Society (hereinafter referred to as the "Committee"), which is a coordination, advisory expert body of the Government of the Slovak Republic for the issues of the development of a knowledge-based society, will also be involved in the

process of coordination of science, technology and innovation. The Committee will have an advisory role for the achievement of harmony between the objectives in the area of science, technology and innovation and the overall context of the development of a knowledge society.

The use of a special methodology of forecasting, which is commonly applied in the old EU Member States and which is known under its denotation **"Technology Foresight" will be one objective in the area of defining medium-term and long-term objectives and aims of the state science and technology policy and regular evaluation of their implementation and updating.** The European Commission expects every Member State of the EU to use this methodology, which entails that beside national experts also foreign experts will be involved in its processes, which is intended to open the state policy to the policies of the other Member States of the European Union, with a view to ensuring competitiveness.

4. THE INFRASTRUCTURE OF RESEARCH AND DEVELOPMENT

4.1 The area of human resources in research and development

Available human resources are the basic prerequisite for the development of science and technology; they are the prerequisites needed to increase the competitiveness of the Slovak economy, more expeditious modernisation of the whole society, and, ultimately, they are the necessary preconditions for a successful development of the knowledge society in its full range. Indeed, well-educated human resources are the necessary preconditions for the development of the knowledge society, **which is why education as one pillar of the knowledge society will be subject of a special attention of the long-term development and exploitation of science and technology.**

Beside the **development of the Slovak education system,** special attention will be paid to encourage the involvement of Slovak research and development organisations in the system of education, research and innovation activities of the currently prepared **European Institute of Technology** (hereinafter referred to as "the EIT") through so-called Knowledge and Innovation Communities. The EIT will be the umbrella for the integration of education, research and development and innovation at European level.

Human resources of research and development are a crucial factor to advance scientific knowledge, technological progress, to improve the quality of life, the prosperity of the European citizens and to contribute to the European competitiveness. It is vital to create an open and sustainable European labour market and **ensure adequate and highly educated human resources in the research and development.**

With a view to ensuring qualified human resources in adequate numbers for the system of science and technology we will have to **boost the interest of young people in working in research and development, which entails to focus the attention on raring and educating potential research and development workers already in primary schools, continue at all types of secondary schools, universities and ensure for both the research and development workers lifelong training.**

Therefore in the education and training for a professional career in research and development the emphasis will be laid on the **development of regional education, with** a view to making science and technology attractive and accessible to pupils and stir their interest for the activities in science

and technology already from the upper grades of primary school by suitable adjusted teaching subjects curricula highlighting the contributions of science and technology to increasing the quality of people's life. Equally students will be stimulated for selecting science and technology as their vocation within extracurricular activities. This approach to securing sufficient human resources for science and technology in all age categories is common in all old Member States of the EU. To pursue this objective, it will be necessary to equip primary schools and all types of secondary schools with modern technical teaching aids and laboratories. The Structural Funds in particular will be one source to secure the modern equipment of regional schools in the forthcoming seven years.

In higher education the main objective prompted by the needs of the European labour market will be to **flexibly adjust the content of the study programmes to the needs of practice and also create new study programmes.** Furthermore, it will be important to **raise the interest of secondary school students to study in all disciplines of science and technology courses** (Section 6 paragraph 3 of the Act No.. 172/2005 Coll.) **contained in the study programmes of university study**, as there is a need to ensure continuity of expertise in all disciplines of science and technology.

At the **first two levels of tertiary education** the aim will be to concentrate on attracting students with aptitudes for science and technology and encourage them to continue upgrading their qualification by taking up doctoral study. **PhD study programmes** will be conceived so as to enable PhD students to actively participate in solving research and development projects and gain experience also during the time spent in business organisations of research and development and in the organisations of research and development abroad. **The creation of conditions for mobility of PhD students and young research workers through support programmes,** with the Ministry of Education as the guarantor, is the basic prerequisite for increasing qualifications of young human resources. To encourage the interest of the young generation to remain working in the research and development, **a system will be have to be created that would facilitate Phd graduates to find employment in the research and development.**

Another objective in the field of human resources will be to attract the research and development workers working abroad to return back and work in the Slovak organisations of research and development. It is therefore important to develop a system that will facilitate young researchers returning from research fellowships abroad to reintegrate in the Slovak research and development organisations.

Another objective is to secure permanent qualification advancement for the research and development workers, which implies the creation of a system of upgrading qualification for research and development staff with a view to achieving certain qualification degrees. The lifelong professional training in research and development with gaining of certain qualification degrees will become the basis for the career advancement of an employee in research and development and his or her financial remuneration. **In this respect we will have to increase awarding** of the employee in research and development for every qualification degree obtained.

In connection with the professional qualification growth of research and development employees it will be necessary for the universities to involve more actively in the design of training modules for employees of small and medium sized enterprises by means of their research and education centres and centres of technology transfer.

A technology and innovation mobility portal, linked to the mobility portals for research and development workers and part of the mobility centres of the European Research Area **will foster**

mobility of the Slovak research and development workers within the EU and also within the research and development sectors by introducing new information means for the mobilities offered to research and development workers at national level. The role of the mobility portals in relevant EU countries is to offer researchers information on potential mobilities, **one of the major objectives by the year 2015. This new objective will create the need to put in place a central information portal for science** within the European Research Area. The central information portal will provide also information on the systems of health and social insurance in the Member States of the EU, the introduction of supplementary pensions and the European health insurance cards.

The objective in the area of human resources in the research and development will be not only to ensure the return of the Slovak experts from abroad to the organisations of research and development in Slovakia but also to create conditions to make the **Slovak organisations of research and development attractive for foreign specialists. In this area we will need to create more acceptable conditions for the stay of foreign experts in Slovakia by amending the Act on the stay of aliens in our territory**. **At the same time, we will have to improve the visa policy for experts from the third countries and lay down the terms and conditions for their activity in Slovak research and development organisations.**

Alongside with the intend to attract human resources from an early school age and from university stage and hence reverse the trends of aging of the research and development community, conditions **will** need to be **created also for the research and development workers to remain active in the research and development. Conditions will be created particularly to retain middle generation of researchers as the main driving force, so that they, upon achieving the relevant scientific qualification degrees** remained working in the research and development, also with regard to the requirements of the newly emerging disciplines and groups of disciplines of science and technology. These conditions will be secured by creating reorientation support programmes that will help to flexibly address the problem of the need to reorient researchers for the work in a newly created science or technology discipline.

In this respect the priority objective will be to create sufficient material security for the qualified research and development staff and enhance the status of the employee of research and development in the public opinion which is important also in directing and increasing funds to support science and technology. A more positive perception of research and development and the significance of the activities carried out by their employees will secure also the objectives in the area of popularisation of science and technology.

Back in 2000 the European Commission declared the objective to improve the position and the role of women in the research and development. Its current efforts are directed at the EU Member States encouraging women working in research and development to promote their professional growth and to assert themselves in the leadership positions. **The objective in this area will be to improve the conditions for the assertion of women in the research and development.**

4.2 <u>The area of technical infrastructure of research and development</u>

In addition to highly qualified human resources a well-functioning system of research and development requires to have modern technical infrastructure of research and development (hereinafter referred to as the "technical infrastructure").

Regular replacement and modernisation of technical infrastructure is necessary not only for the research and development carried out for the Slovak consumer sphere. To the same degree it is a condition for equal participation of the Slovak research and development organisations in the projects of close partnerships with the cutting-edge laboratories of the other EU states. **Modernisation of technical infrastructure will be implemented systematically and continuously by means of the support from the public funds (structural funds, national budget) and from business sources,** in line with the principles applied within the European Research Area.

Beside the **forms of support from the structural funds** implemented in the period 2007 - 2013, by the year 2015, also the **forms of financial support from the state budget** will be provided on a continuous basis. There will be a requirement though for the technical infrastructure modernised and maintained in this way to be available to all organisations of research and development, to public higher education institutions and the state research and development organisations free of charge. The organisations of research and development that will obtain support for building and modernising technical infrastructure from the public funds will be obliged to notify thus managed technical infrastructure to the Ministry of Education for it to make that publicly known. The Ministry of Education will post **the list of technical infrastructure maintained from the public funds** at the Central Information Portal for Science, Technology and Innovation making it publicly **accessible to all those interested to use it.** Those interested to use this publicly promoted technical infrastructure will, based on the list, directly contact the organisation of research and development managing the relevant facilities with a request for use. The use of the technical infrastructure will also be publicised on the central information portal.

Alongside of the form of direct financial support for building technical infrastructure from the public funds (state budget and structural funds) the **objective is to ensure building technical infrastructure, particularly the major projects, such as science and technology parks through investment assistance** – creating interesting conditions for investment into building and developing technical infrastructure for domestic and foreign investors.

The improvement of mutual cooperation of individual sectors of research and development (state sector, higher education sector, business sector and the not-for-profit sector) **and each of them vis-à-vis the consumer practice** contributes **to intensified use of results of research and development in the economic and societal practice.** The improvement of this cooperation will be ensured through improving mutual information facilitated by the **Central Information Portal for Science, Technology and Innovation** administered by the Ministry of Education and **by creating and operating virtual networks** whose role it will be to publicise and make the results of research and development available. For this reason it will be extremely important to **build and operate virtual networks with a view to supporting the basic services for Slovak and European research and development community via a mechanism of the type used in case of trans-European networks (TEN-s).**

4.3 Institutional background of science and technology

The higher education sector and the state research and development sector (the Slovak Academy of Sciences and sectoral contributory and budgetary organisations of research and development) are the generators of knowledge (results of the basic research) that cannot remain unexploited but must be made available to the subscribers from the economic or societal practice. It will be necessary to

highlight that this **knowledge potential** should be **licensed** by reason of the protection of intellectual property.

In all countries of the EU the public sector of research and development (i.e. in Slovakia public higher education institutions, institutes of the Slovak Academy of Sciences, and the sectoral contributory and budgetary research institutes) is expected to focus more on the solution of the problems the results of which will have a higher level of transfer for the society insofar as there is very poor link between "knowledge driven research in universities" and the innovation. **Hence the main goal will be to require the public research and development sector to step up the efforts to solve the issues in the fields of key economic and societal interest that will be exploited in practice, whereby the private sector will generate its activities on the results of research and development.**

The sector of commercial research and development is expected to raise expenditure on research and development, in line with the requirement of the Lisbon Strategy so that the business sector would participate in the overall support of research and development by two-thirds. **Accordingly, the objective will be to create such legislative measures in the tax system** that would motivate the business sector to increase investments in research and development.

In an effort to **ensure conditions for the transfer of knowledge** produced by the public research and development sector into economic and societal practice support will be given to such types of organisations as: **the national centres of research and development, science and technology parks, technology centres, centres of excellence, spin offs, starts up, centres of technology transfer, and technology incubators.** For more detailed specifications of these types of organisations, see Annex 2 to the material.

Regional self-government authorities will create conditions, within the scope of their competencies, for the **establishment of the so-called regional start-up centres – business centres** (they will provide advice and assistance to those interested to set up e.g. commercial research and development organisations, or organisations of technology transfer) **and the start-up capital funds** that will help with information and start-up capital resources to the starting private firms in the relevant regions. Beside these conditions **self-governing regions** will also ensure conditions for the creation of **new types of regional partnerships of the public sector of research and development and the business sector.**

In supporting organisations of research and development, special attention will be paid to foster small and medium-sized businesses concerned with research and development. Research, development and innovation undertaken by small and medium-sized enterprises will be prioritised through new measures to obtain support from the state budget and the structural funds.

5. SYSTEMIC PRIORITIES OF SCIENCE AND TECHNOLOGY

By 2015 such systemic priorities of science and technology will need to be set as to make science and technology a harmonious and stable system, which will have an outward bound effect of being a dynamising element fully contributing to the economic and social development of the country. The systemic priorities in the area of science and technology in the outlook by 2015 will include:

- to achieve **synergies from the support for research and development provided from**

different sources of support for research and development – state budget, commercial sources, structural funds, and the resources of the Seventh Framework Programme of the EU for research, technological development, and demonstration activities,

- ensure **effective support for human resources of research and development and technical infrastructure of research and development,**
- secure the corresponding **direct and indirect support of science and technology,**
- ensure **effective implementation of public funds effected** (funding from the state budget and the structural funds),
- direct **to a significant extent the support from public funds at the research conducive to subsequent further exploitation,** whereby the **improvement of the linkage of basic and applied research will be pursued** on the basis of the increased cooperation of the public sector with the business sector of research and development and the economic and societal subscriber practice,
- increase **accountability of ministries and other central authorities for the development of their respective sectors by means of research and development,** which will be implemented in practice by the development and implementation of "sectoral concepts of research and development", and by setting aside resources in the ministerial chapters, the budget chapters of other central authorities and of the Slovak Academy of Sciences as designated support for science and technology ,
- increase the **economic and social contributions** for Slovakia **of the international scientific and technological cooperation ,**
- contribute through **science and technology to raising the competitive capacity** of domestic production and services.

6. SUBSTANTIVE PRIORITIES OF RESEARCH AND DEVELOPMENT

Apart from ensuring adequate resources for the support of science and technology, setting substantive priorities of research and development is one of the most significant objectives. Identification of substantive priorities draws on two main prerequisites, namely the available capacities of research and development by individual groups of science and technology disciplines, and the applicability of the results of research and development in the economic or societal practice. A more detailed justification for the need to have substantive priorities of research and development and the starting points for their setting are given in Annex 3.

In the Slovak Republic it is necessary to set substantive priorities of research and development in the outlook by 2015 that will apply to:

- the identification of themes for the state programmes of research and development,
- the drawing of funds from the Structural Funds under the Operational Programme "Research and Development",
- the support for directed research and development through the Agency for Support of Research and Development.

Cross-cutting objectives of the proposed substantive priorities of research and development include:

- to ensure sustainability of the development of the country,
- the development of the knowledge society,
- to ensure a more profound economic and social contribution of research and

development.

In their sectoral concepts for the directions and support of research and development the ministries, central authorities and the Slovak Academy of Sciences will set the substantive priorities of research and development in such a way as to **avoid duplication with** the substantive priorities of research and development approved in this material.

6.1 Proposal for substantive priorities of research and development

6.1.1 Health – quality of life

Annotation:

The research and development designed to ensure health of citizens will focus on the **prevention** and **treatment** of the most prevalent life threatening diseases and the diseases frustrating full involvement in work and societal life. It involves in particular the prevention and treatment of cardiovascular diseases, early diagnostics and treatment of oncologic diseases, which are diseases with highest mortality rates in Slovakia. Attention will be devoted also to virology and infections diseases, clinical immunology, chronic degenerative metabolic diseases, applied microbiology, respiratory diseases, geriatric diseases, allergies, etc. Special attention will be paid to the prevention and treatment of metal disorders, particularly depression, as the most prevalent condition in Slovakia obstructing the full quality life. The core themes will include:

- the promotion of a healthy life style – prevention is the best cure, knowledge is the best prevention;
- the transfer of knowledge of molecular medicine into clinical practice – the implementation of the knowledge potential of the human genome,
- genetics and medical biotechnologies.

Food products and their primary source, agriculture, are a factor that substantially affects the individuals' health and hence also their quality of life. In this respect attention will be given to the research and development in the areas:

- safer, healthier and better quality food products – increased consumption and global food processing industry as potential risks to health,
- ecologisation of agriculture.

The individual's health and his work capacity are to a large extent affected by the working environment, working conditions, and good working relations. It is therefore necessary to direct the attention of research and development to the areas of good or decent work from the aspect of technical equipment, interpersonal relations, updating of vocational knowledge and skills of employees linked to the scientific and technological progress, and the creation of a system of social security allowing smooth and safe transitions between jobs.

6.1.2 Progressive materials and technologies

Annotation:

Globalisation of economy opens up a chance to succeed only to the highly specialised producers with a permanent innovation policy. Slovak producers face the challenge of having to place their products within the market of the EU and other countries. In order to succeed they need a system

generating new knowledge, on a continuous basis, from the fields of selected materials and production technologies. .

This necessitates a systematic development of research and development in new materials, such as **construction materials** (construction, engineering, consumer), **functional materials** (electrical, magnetic, optic, biocompatible, plastics), **composite, multifunctional and intelligent materials, nanomaterials; in introducing new production technologies, including nanotechnologies.** Furthermore, it is necessary to refine analytical and numerical methods for properties forecasting of the equipment made of new materials (virtual testing) and develop suitable methods of measuring their properties. The assessment of potential health and environmental risks and the substitution of environmentally wrong materials in accordance with the chemical legislation of the EU (REACH) must be an integral component of research.

6.1.3 Biotechnologies

Annotation:

The research and development in the area of biotechnologies will be **directed particularly at the industrial biotechnologies** for the manufacturing of chemicals, materials and at bioenergetics using fermentation or enzyme catalysis, with the use of microorganisms or their enzymes. Research and development in this area will also focus on agribiotechnologies using the most recent knowledge of plant improvement, microorganism and animal breeding by means of targeted gene transfer with a view to improving the utility, nutrition and health values of food products and the economic parameters of the agricultural commodities.

6.1.4 Knowledge technologies supported with information and communication technologies

Annotation:

The volume of knowledge that is currently available to us exceeds considerably our capacity to use it effectively. The diagnostics of the current state of knowledge society in the historical perspective, the Quality of human potential in the symbiosis with the new function of research and development as the key factors of dynamic development of the country, the Development of technologies facilitating search for, classification, interpretation and implementation of knowledge are the necessary preconditions for a successful progress of Slovakia as a knowledge society.

The research in this field must be directed at the **development and application of technical means, information and communication technologies and mechatronics** on the one hand**,** and the development of software allowing to solve the tasks of information management in the electronic services and the systems of effective management of various societal activities, on the other.

Greater attention of research will be devoted to the development of knowledge technologies, applying automated robotics-based complexes and using progressive laser, electron beam and plasma technologies.

6.1.5 Infrastructure of the society

Annotation:

Ensuring the development of the society's infrastructure is a major condition in the process of globalisation. Hence the decisive role in the forthcoming period will be held by the research and development focused on:

- the size and structure of the population by age groups, level of education, and

regional distribution,
- the size and structure of unemployment and employment,
- the number and structure of the existing, created and lost jobs in the branches of economy and in the regions, including from the aspect of their qualification demands,
- optimisation of settlement and economic activities – landscape engineering from the aspect of sustainable development of the country,
- creation and protection of natural and rural potential of Slovakia,
- optimisation of transport needs of the society, the development and building of intelligent transport systems,
- planning of future development of transport with account taken of the impacts on social, economic and environment fields,
- the architecture of postal networks and technologies,
- telecommunications – the future-generation networks and services,
- digital interactive services of radio and television broadcasting,
- implementation of electronic communication services (*e-commerce/e-business*),
- creation of human microenvironment.

6.1.6 Energy and energetics

Annotation:

The energy supply industry of the European Union and Slovakia is currently dependent on the imports of the energy producing materials (crude petroleum, natural gas, uranium). For further development of economy and in order to secure adequate quality of life it is necessary to increase the energy security of Slovakia by means of efficient exploitation of energy sources found in our own territory. The research and development in a wide range of science and technology disciplines will be focused chiefly on new and renewable, ecologically acceptable sources of energy, rationalisation of energy consumption in all industrial and non-industrial branches, and the energy distribution.

To this effect it is vital to develop research and development in a number of areas: the research into the geothermal energy sources and their exploitation; development of technologies for obtaining electricity and heat from renewable sources (water, sun, wind, biomass); research into potential deposits of the energy producing materials (coal, crude petroleum, natural gas, uranium) in the territory of Slovakia and possibilities of their extraction; research into the nuclear energy with the emphasis on safety and storage of burned down fuel; research into the fourth-generation reactors and the issues of nuclear fusion (involvement of Slovakia in the global projects ITER and DEMO); the development of new systems of energy transmission (power cables eliminating stray electric and magnetic fields).

6.1.7 Civilisation challenges

Annotation:

In the area of social sciences the main focus should be on the search for **solutions of the problems of social inclusion/exclusion, the accompanying symptom of which are factors preventing from full realisation and decent life of citizens of marginalized groups.** The research in this area will also look at the **problems of education for citizenship, the transformation of values and the position of the individual in the social relations network, partnerships**, networks and targeted activities to involve all the actors on the labour market

designed for the prevention and solution of the implications of social inclusion.

Other areas of research and development will include the development of methods and forms of education, effective management, internationalisation of the EU area, including the issues of the growing population migration and its implications for the population of Slovakia.

Globalisation, as a dynamic, multidimensional process of economic, social, political, technological, ecological, cultural, religious, military-strategic and other change, the new opportunities and threats – they all penetrate the lives of the nations, increasing their existential linkage and dependence. The profound changes in the functioning of the world economy, in the interaction with other aspects of the globalisation processes, make new demands on the adaptability of small countries, such as Slovakia, with an open economy, and create a need to address through research such problems as:

- globalisation and its impact on the dynamics of the social change in the Slovak Republic ,
- the human, social and cultural capital – the strategy of their development under the conditions of globalisation,
- the area of social insurance,
- the European law and the legal conscience of the Slovak society.

6.1.8 The cultural and artistic heritage of Slovakia

Annotation:

Globalisation in the post-modern era raised several essential issues for the society that concern the economy, policy and communication but also the **problems of national culture**, and **minority cultures**, cultural **heritage and other segments of culture, their preservation and development**. The European Union has declared its commitment to be unified in its diversity.

The challenge of intense study, preservation and, where possible, **digitalisation and archiving of the artefacts of national culture and the culture of minorities, be it in the area of language or literature, fine arts, architecture, music, folk culture** or other areas of culture, is extremely important for all nations of the European Union.

The objective of the research programme is to show that the national culture has been evolving in the European context and that it belongs to this context and to the European conscience. The contribution of Slovakia to the European and the world cultural heritage must be intensively studied and made visible for the specialist and subsequently also general public worldwide.

6.1.9 Security and defence

Annotation:

The safeguarding of the population against threats such as terrorism, natural disasters, man-made disasters, and other catastrophes has been reserved by the European Commission for the competence of the Member States of the EU and simultaneously included in the FP 7, in which only a fraction of the needed research is being ensured under topic 10 of the Specific Programme "Cooperation". It involves an interdisciplinary theme, in which participate jointly natural, technical and social sciences and humanities. Research is oriented so as to allow ensuring prevention, management of particular catastrophes and subsequent consolidation of the situation. The core of the research draws on the technology and research into new types of detectors (of chemical and

biological weapons of mass destruction, explosives, radioactive materials, drugs, etc.), information technologies (presence of persons, objects, communication, simulation, risk analysis), solution of healthcare in the field, management of shocks, stress, and consolidation of economy, transport, and communications. The research will be aimed at civil exploitation, only exceptionally the security classification regimen is assumed.

The programme directions of the defence research and technology development should mainly focus on the objectives following out of the membership of the Slovak Republic to the NATO and the EU. They include in particular:

- systems of reconnaissance, surveillance, and identification in the urban (build up) area,
- detection and identification of biologic and chemical substances and toxic chemical substances, protection against them and decontamination,
- digitalisation and integration of means into centrist networks,
- protection and security of information systems,
- reduction of observability,.
- systems modelling and simulation,
- creation of common operational picture,
- exploitation of nanotechnologies in the defence systems;
- micro-electromechanic systems (MEMS),
- protection of live force and increasing of ballistic protection,
- mobility in the built up areas. .

6.1.10 Exploitation, protection and reproduction of biologic sources

Annotation:

Modern, perspective and sustainable agriculture (agriculture, food processing industry and forestry) is a complex of multifunctional systems, with complex biological processes, as the foundation of the production processes, which are implemented in an open variable space of the country, using, protecting and reproducing the resources comprising the main components of the nature and environment, and are subject of research in every developed country.

The subject of research in agriculture will be the identification and evaluation of soil deficits in the territory of Slovakia, gathering information on the essence of the exploitation of living organisms, actions within them, and the interactions of animate and inanimate components of agriculture. Conditions will be created that will be used for developing public policies facilitating a balanced development of agriculture and rural areas by means of making greater use of production factors. New knowledge will also support the competitiveness of Slovak food produce, while respecting the international WTO rules (World Trade Organisation). The acquisition of new knowledge of the properties and functions of the soil cover of the SR, coupled with the creation of optimisation programmes of multifunctional use of soil and its protection against the degradation processes will be the starting point for the sustainable regional development of the SR.

In food industry research will involve the elimination of detrimental, potentially detrimental and thus far unexplored effects on foodstuffs, and the diet modelling along the intentions of most recent body of knowledge of human nutrition.

Flexible and adaptable schemes and methods of exploitation of sustainable forestry management will be formed, which will permit to strengthen the ecological stability, rational exploitation of natural resources and functional landscape potential, whereby new impulses will be created for a comprehensive development of the rural landscape and increased employment in socially most vulnerable regions.

6.1.11 Environment protection

Annotation:

This priority comprises all the areas of the environment protection and the involvement of human resources in the improvement of environment ranging from the research into the state of environment, the study of the environmental impacts of human activity, to the technology of environmental protection. The emphasis is laid on areas, such as prevention of degradation and contamination of environment, the techniques of waste processing and disposal, recycling**, research and development in the area of measures against negative impacts of climatic changes.**

A special emphasis will be on the research into:

- environmental aspects of settlements and landscape with a view to securing sustainability of their development,
- creation of job opportunities and potential avenues of using human resources in the interest of improving the environmental conditions,
- the impact of electromagnetic fields on the living organism.

The study of mutual connections and interdependencies between the economic, social and environmental development will be an integral part of research, with regard taken of the impact of globalisation and integration as the key conditions of sustainable development, with a view to achieving high quality of life of citizens, both at national and regional level. Identification of those elements of sustainable development that support all its aspects and that create barriers for this process requires special attention.

6.1.12 Exploitation of domestic mineral resources

Annotation:

The exploitation of the potential of the Slovak mineral resources is one of the starting points how to ensure a balanced regional development and create new job opportunities. The manufacture of final products based on domestic raw materials constitutes a significant contribution to increasing the added value and competitiveness of the production. Yet, the intensification of the exploitation of domestic raw materials must be based on considerations for environmental principles and the principles of sustainable development.

The research and development will be directed at increasing the degree of utilisation and finalisation of domestic natural, particularly, renewable resources. The focus will be on the research and development of engineering components, products and materials based on wood, with improved utility properties; ecologisation of the production, for example, of sulphide and natron pulps, and the development of new kinds of paper for digital printing, the improvement of the parameters of materials for the manufacture of packaging. In additions, research and development activities will have to be aimed at the achievement of higher finalisation of magnetite processing, basalt processing,

the processing of raw materials on the basis of silicates and clay materials.

7. THE SUPPORT FOR SCIENCE AND TECHNOLOGY

In order to ensure increased expenditure on science and technology from the state budget and to have a transparent overview of the actually required spending on science and technology in all budget chapters for the ensuing budget year, it will be necessary for the Ministry of Education to coordinate, in cooperation with the administrators of budget chapters (the other ministries, central authorities, and the Slovak Academy of Sciences) the preparation of a joint proposal of the state budget for science and technology in the Slovak Republic for the relevant budget year. **Hence the objective will be to propose in the budget for the relevant budget year and keep track of the "summary draft revenues and expenditures of the state budget for science and technology** in the Slovak Republic for the relevant budget year." In practical terms this implies that the Ministry of Education will coordinate the provision of resources from the state budget in the budget chapters of the other chapters´ administrators for the implementation of their sectoral development goals through research and development. **This goal will be implemented also through legislative avenue, namely within the amendment of the Act No. 172/2005 Coll. on the organisation of state support of research and development, scheduled to be approved in 2008.**

The support for science and technology is the most important systemic priority. It is implemented by means of two forms, direct and indirect support. As a rule, attention in this respect used to be focused on direct support, but owing to the need to ensure increased share of business resources for the development of science and technology, in accordance with the Lisbon Strategy, it will be necessary to focus also on the area of indirect support for science and technology and establish incentives for the business sector.

7.1 Direct support of science and technology

To ensure the implementation of the objectives and goals of the development of science and technology by 2015, a total expenditure on science and technology will be required at 1.8% of the GDP in 2015.

One important priority in the direct support for science and technology will be to raise the participation of the business resources in the support of science and technology so as to reach a **2/3 proportion of these resources in the overall support for science and technology** in 2015. Therefore in order to ensure increased participation of business resources it will be necessary to create incentives of indirect support for business entities and to improve the collection of data on investments of these entities for statistical reporting, in accordance with the OECD standards.

The trend of setting the increase in the total expenditures for science and technology by the year 2015, including the increase in the expenditures from the state budget, business sources and foreign sources, must be based on the fact the overall expenditure on science and technology in 2015 will comprise 1.8 % of the GDP, and that the share of expenditures from the business sources in 2015 will reach the value of 2/3 of the overall expenditures. The following table gives the information on the estimated expenditures on science and technology in relevant budget years from the state budget, from business sources and from foreign sources by the year 2015.

Table 1. Estimated trends of increased intensity of expenditures on science and technology from the state budget, from business sources, and from foreign sources by the year 2015 (in % of

GDP)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015
TE	**0.68**	**0.82**	**0.96**	**1.10**	**1.24**	**1.38**	**1.52**	**1.66**	**1.800**
SB	**0.39**	**0.412**	**0.434**	**0.456**	**0.478**	**0.500**	**0.522**	**0.544**	**0.566**
BS	**0.25**	**0.36**	**0.47**	**0.58**	**0.69**	**0.80**	**0.91**	**1.02**	**1.13**
FS	**0.04**	**0.048**	**0.056**	**0.064**	**0.072**	**0.080**	**0.088**	**0.096**	**0.104**

Abbreviations: TE – total expenditures on science and technology, **SB** – resources from the state budget, **BS** – resources from business sources, **FS** – resources from foreign sources

Explanation for the table: In the estimation of the growth trends in exepditure on science and technology from TE, SB, BS and FS we draw on the fact that the expenditure on science and technology from the SB in 2007 has been budgeted at around 7 billion SKK (the data of the Ministry of Finance of the SR) and on the fact that the shares of expenditures of SB, BS and FS in 2007 remain at the level of the year 2005, i.e. the expenditure of the **SB will be 57% of the TE,** the expenditure from **BS will be 36.6% of the TE** and **FS will make up 6.4% of the TE**. If the expenditure of the SB at 7 billion SKK makes up 57 % of the TE, then the BS (which are 36.6% of the TE) are 4. 49 billion SKK and the FS (which are 6.4% of the TE) are 0.79 billion SKK. Based on the above, **then TE (as SB+BS+FS) is 12.28 billion SKK, which is 0.68% of the GDP.**

The expenditure in 2007 from the SB (7 Billion SKK) makes up 0.39**% of the GDP**, the **expenditure from the BS** makes up 0.25**% of the GDP** and the **expenditure from the FS** makes up 0.04**% of the GDP**.

If we estimate that **in 2015 the TE will amount to around 1.8% of the GDP,** the **expenditure** from the **SB should make up around 1/3 of the TE,** the **expenditure from BS should amount to 2/3 of the TE** (the Lisbon Strategy target), **and** the **expenditure from FS will also grow** (in 2015 they will be around 0.104% of the GDP: FS = TE - /SB +BS/), then we can estimate the growth trend of TE, SB, BS and FS (in % of the GDP) in the years 2008 to 2014. Table 1 gives the concrete data.

In the years 2007 – 2013 (in addition to the already existing support, from 2004, of human resources in research and development from the European Social Fund) another source of public funding will participate in the support of research and development in the Slovak Republic, namely the European Regional Development Fund. The resources from this fund will be provided under the Operational Programme "Research and Development". The support provided under this operational programme will contribute, to a substantial extent, to the modernisation and revitalisation of research and development technical infrastructure.

Table 2 Estimated allocations of expenditure from the ERDF for the support of research and development in the SR under the Operational Programme "Research and Development" (in billion SKK /with the exchange rate approximately 33.50 SKK/1 EUR) and the co-financing allocations from the resources of the State Budget

Year	2007	2008	2009	2010	2011	2012	2013
ERDF in billion SKK	*5.76*	*5.61*	*5.40*	*4.98*	*5.36*	*5.91*	*7.50*
2. ERDF in % of GDP	*0.32*	*0.29*	*0.26*	*0.22*	*0.23*	*0.24*	*0.29*
Contribution at 15% from NR to ERDF	*1.02*	*0.99*	*0.95*	*0.88*	*0.95*	*1.04*	*1.32*
3.Contribution at 15% from the NR to ERDF v % of GDP	*0.06*	*0.05*	*0.05*	*0.04*	*0.04*	*0.04*	*0.05*

Abbreviations: ERDF – resources of the European Regional Development Fund, **NR** – national resources from the state budget

Explanation for the table: The estimated allocation of the resources from the ERDF is based on the data[1] from the Operational Programme "Research and Development" but these are still in the proposal stage because the European Commission has not yet approved the operational programmes.

The resources from the state budget designed to support science and technology will continue to be provided as the institutional support and the designated (purpose) support. In this respect the **objective will** be to continue the trend[2] of changing the proportions of institutional and designated support of science and technology to the befit of the designated purpose financing. In 2015 the designated support from the state budget resources should rise to 65%.

Table 3 Estimated distribution of SB expenditures between the institutional support and particular forms of designated purpose support

Year		**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Estimated expenditure of the SB in billion SKK by % of SB of GDP in Table 1										
SB		**7.00**	**8.00**	**9.00**	**10.10**	**11.24**	**12.43**	**13.68**	**15.00**	**16.36**
Estimated proportions of institutional support (IS) and designated support (DS) in %										
IS (%)		**60.00**	**56.88**	**53.75**	**50.63**	**47.50**	**44.38**	**41.25**	**38.13**	**35.00**
DS (%)		**40.00**	**43.12**	**46.25**	**49.7**	**52.50**	**55.62**	**58.75**	**61.87**	**65.00**
Estimated development in the amount of expenditure of the SB on institutional support and designated support in billion SKK										
IS		**4.2**	**4.55**	**4.84**	**5.11**	**5.34**	**5.52**	**5.64**	**5.72**	**5.73**
DS		**2.8**	**3.45**	**4.16**	**4.97**	**5.90**	**6.91**	**8.04**	**9.28**	**10.63**
IS	***HE***	***2.2***	***2.39***	***2.54***	***2.68***	***2.80***	***2.89***	***2.95***	***2.99***	***3.00***
	SAS	***1.5***	***1.62***	***1.72***	***1.82***	***1.90***	***1.97***	***2.02***	***2.05***	***2.05***
	OSRI	***0.5***	***0.54***	***0.58***	***0.61***	***0.64***	***0.66***	***0.67***	***0.68***	***0.68***
Estimated development in the amount of expenditure of the SB on designated financing: SPJ R&D, STP R&D, ASRD, PK and from PK for ISTC in billion SKK										
DS	SPJ R&D	**0.50**	**0.52**	**0.62**	**0.75**	**0.88**	**1.04**	**1.21**	**1.39**	**1.60**
	STP R&D	**0.50**	**1.21**	**1.46**	**1.74**	**2.07**	**2.42**	**2.81**	**3.25**	**3.72**
	ASRD	**0.95**	**1.21**	**1.46**	**1.74**	**2.07**	**2.42**	**2.81**	**3.25**	**3.72**
	CHA SSTP	**0.50**	**0.51**	**0.62**	**0.74**	**0.88**	**1.03**	**1.21**	**1.39**	**1.59**
	ISTC (from CHA SSTP)	**0.25**	**0.25**	**0.31**	**0.37**	**0.44**	**0.51**	**0.60**	**0.69**	**0.79**

Abbreviation: SB – state budget, **HE** – higher education institutions, **SAS** – Slovak Academy of Sciences, **SPJ R&D –** sectoral projects of research and development, **STP R&D** – state programmes of research and development and the state programmes of research and development infrastructure development, **ASRD** – Agency for the Support of Research and Development, **CHA SSTP –** coordination of horizontal activities of state science and technology policy and included is the allocation of **ISTC** – international science and technology cooperation, **IS** – institutional support, **O SRI** – other sectoral research institutes, **DS** – designated support.

[1] Operational Programme "Research and Development" – version forwarded to the EC on 31 July 2007

[2] Graph D.5 from the "Annual Report on the state of research and development in the Slovak Republic and its international comparison in 2005" approved by the SR Government Resolution No. 1012/2006

Explanation for the table: SB – The amount of expenditure from the state budget in billion SKK in relevant budget years is estimated from the data expressed as % of the GDP and the estimate of the growth of GDP by 2015, given in Table 2 of the Financial Impacts Clause.

If we want to estimate the development trend in the support of particular components of institutional support and designated support, we have to start from the fact that in 2015 the ration of IS to DS should be 35%: 65%;

If we want to estimate the development in the support of particular components of institutional support (IS), then we have to start from the fact than in **the year 2007 the IS** of **HE** budgeted at 2.2 billion SKK (1.2 billion SKK – science at higher education institutions (HE) + 1 billion SKK – wages of teachers of HE), IS of SAS at circa 1.5 billion SKK and the IS on other sectoral research institutes is budgeted at around 500 mil. SKK. This means that the total **institutional support in 2007 is budgeted at around 4.2 billion SKK. If in 2015 the institutional support should make up 35 % of the overall expenditure from the SB on Science and Technology,** this means that in 2015 the IS will be at around 5.73 mil. SKK. From the amount of IS in 2007 and in 2015 we are able to estimate the year-on-year decrease in IS, which will be at circa 3.125 billion SKK.

If IS in 2007 is directed at 52.38% to support higher education institutions, at 35.71 % for the support of the Slovak Academy of Sciences, and at 11.91% for the support of other sectoral research institutes, and if we assume the expenditure on the cited items to be effected at this ratio also in 2015, then in 2015 the expenditure on HE will be circa 3.00 billion SKK, on SAS 2.05, and on OSRI circa 0.68 billion SKK, respectively.

DS in 2007 is budged at circa 2.8 billion SKK. If we want to reach in 2015 a ratio of IS to DS of 35%: 65%, then in 2015 the designated support will be at circa 10.63 billion SKK. DS in the years 2008 and 2014 can be estimated from the year-on-year increase by 3.125%.

The estimate of resources for designated support (DS) is still subdivided into the estimate of the expenditure on **SPJ R+D** (a new form of support of sectoral projects) and, pursuant to Section 5 paragraph 2 of the Act No. 172/2005 Coll., the estimate of the distribution of designated support among 3 **items according to the "National Programme for the Development of Science and Technology"**.

The estimate of expenditure for SPJ R+D draws on the fact that the expenditures for DS in the sectors in 2006 was around 500 mil. Sk[3] and we want to achieve that they make up **maximum 15% of the total DS** in the relevant years. Hence, the **expenditure on SPJ R+D in 2015 will amount to around 1.60 billion SKK** and in the relevant years will reach the estimated values given in the table.

The estimate of expenditure on the 3 items of the "National Programme for the Development of Science and Technology" is based on the objective to **have the ratios** between **STP R&D: ASRD : CHS SSTP in the relevant years by 2015 at 35%:35%:15%**. **From the estimated expenditure for CHS SSTP the estimate for International Cooperation is separately set aside (IC makes up 50% of the estimated expenditure for CHS SSTP)**, which is an important item to ensure equal participation of the Slovak Republic in the common competitive environment of the European Research Area.

7.2 Indirect support of science and technology

[3] The Report on the state of research and development in the SR in 2006 with the assessment of the success rate and efficiency of the grant schemes for the support of research and development financed from the public funds, SR Government Resolution No. 490/2007

One of the main objectives of the Lisbon Strategy is to bring up the proportion of expenditure of the business sphere to a level of 2/3 of the total expenditure on science and technology. Therefore, the **main objective in indirect support of science and technology will be to introduce tax instruments** the application of which will ensure increased investment by the businesses entities into science and technology.

In the light of the current state in the participation of business sources in the overall support of science and technology, which in 2005 was at circa 37%, **it is necessary to put in place indirect instruments that will operate as motivation factors for the private sphere to invest more in the support of research and development, because it is expected (according to Table 1) that the business resources will co-participate at 2/3 in the overall expenditure in 2015.** The EU countries implement these incentives most commonly by measures taken in their tax systems (see Annex 1). **Hence the main objective in the indirect support of science and technology will be the introduction of tax instruments for the business entities to increase their investment in science and technology.**

However, the introduction of tax incentives must be compatible with the EU legislation, as the tax incentives introduced by particular countries of the EU have to comply with the condition of non-discrimination of certain entities in the common competitive environment, they must not be in conflict with the legislation on the provision of the State aid, and upon their introduction, their contribution must be evaluated on a permanent basis. For these reasons, **the Ministry of Education in working with the Ministry of Finance of the Slovak Republic must conduct an analysis for the introduction of tax incentives for the business sphere** that will evaluate consistently the conditions and possibilities for the proposal of a concrete type of tax incentives.

8. FRAMEWORK MODEL OF THE ORGANISATION OF SUPPORT OF SCIENCE AND TECHNOLOGY IN THE SLOVAK REPUBLIC BY 2015

In the period of 2007 – 2015 the science and technology in the Slovak Republic will be supported mainly from the following sources of support:

- ✓ state budget of the Slovak Republic,
- ✓ resources of the Structural Funds of the European Union,
- ✓ business sources,
- ✓ international sources.

8.1 Support from the State Budget of the Slovak Republic

From the state budget financial support for science and technology will be secured through the state budget chapters of:

- the Ministry,
- other ministries and central authorities that ensure the solution of their sectoral problems through research and development,
- The Slovak Academy of Sciences.

The state budget funds designed for the support of science and technology will continue to be provided as:

- ➢ institutional support ,

- designated support (via public competitive calls – provision of so-called „grants“).

The institutional support of science and technology (hereinafter referred to as "institutional support") will be provided though the budget chapters of:

- the Ministry, for the public higher education institutions and state higher education institutions,
- the Slovak Academy of Sciences for the state budgetary and contributory institutes of the Slovak Academy of Sciences,
- the state budgetary and state contributory sectoral institutes, founded by other ministries, or central authorities.

The institutional support to the cited organisations will be provided on the basis of contractual relations between the provider of the institutional funding and the relevant organisation, with a specification of the substantive directions for the use of institutional funding.

The designated support of science and technology from the state budget (hereinafter referred to as " designated support") will continue to be provided through the state programmes of research and development, the state programmes for infrastructure development of research and development, the Agency for the Support of Research and Development, and through the newly introduced category of so-called "sectoral research and development projects". This category of projects will be officially introduced within the amendment of the Act No. 172/2005 Coll.

The designated support will be provided in accordance with the results of the public competitive procedure, and **on the basis of a contract** in which the terms and conditions of the use of designated support funds will be specified.

The objective is for the designated support to have a growing trend relative to the intuitional and that ratio of the institutional to designated support **in 2015** should reach **30% : 70%.**

8.1.1 Support of science and technology from the budget chapter of the Ministry

8.1.1.1 Institutional support of science and technology through the Ministry

The institutional support through the Ministry will be implemented through:

- the Scientific Grant Agency (hereinafter referred to as „VEGA“)
- and the Cultural and Educational Grant Agency (hereinafter referred to as „KEGA“).

VEGA, as a joint advisory body of the Deputy Prime Minister of the Slovak Republic and the Minister of Education and the President of the Slovak Academy of Sciences (hereinafter referred to as the "SAS") for the selection of institutional projects of public and state higher education institutions and the SAS, will continue to ensure a common competitive environment for the selection of institutional projects for the support from the state budget. The higher education projects selected for the SB support will continue to receive the support from the budget chapter of the Ministry, and the institutional projects of SAS, from the budget chapter of the SAS.

KEGA*,* as an advisory body of the Deputy Prime Minister and the Minister of Education will continue to exist and will ensure the technical assessment of projects applying for support on publishing of university study texts, textbooks, and for other activities securing the teaching process in higher education institutions.

Beneficiaries of funds: higher education institutions in the Slovak Republic

8.1.1.2 Designated support of science and technology through the Ministry

From the budget chapter of the Ministry, as the central body responsible for the development and implementation of the state science and technology policy, science and technology will be supported, in the designated form, by means of a public competitive call open to all organisations of research and development in the Slovak Republic, through the following forms of support:

- state programmes,
- state programmes of infrastructure development,
- projects of the Agency for the Support of Research and Development,
- programmes of the Agency for the Support of Research and Development,
- investment assistance for building major technical infrastructure.

Beneficiaries of funds: organisations of the higher education sector, state sector of research and development, business sector of research and development, not-for-profit sector of research and development, natural persons of research and development within the meaning of the Trade Act; domestic and foreign investors. .

8.1.1.2.1 State programmes of research and development

State programmes of research and development will draw on the themes of the state programmes approved by the Government of the SR in the long-term plan. They will ensure fulfilment of the requirements of the state to develop certain economic or social areas of Slovakia through research and development. Their fulfilment will be implemented by the state programme projects whose period of solution will be limited to three or maximum four years. State programmes will be formulated for 9 years, with 3-year control phases for review and potential subsequent updating.

Beneficiaries of funds: organisations of the higher education sector, state sector of research and development, business sector of research and development, not-for-profit sector of research and development, natural persons of research and development within the meaning of the Trade Act.

8.1.1.2.2 State programmes of the infrastructure development of research and development

Through the **state programme of infrastructure development** support will be given to the foundation and initial stage of functioning of a special type of organisation that will ensure the knowledge transfer into economic or societal practice.

From the organisations that will ensure knowledge transfer, the Ministry of Education will, from 2008, **provide support for the establishment and initial phase of the existence of the National Centres of Research and Development and the Science and Technology Parks,** through state programmes of infrastructure development**.**

The other types of organisations for knowledge transfer: the Technology Centres, Centres of Excellence, Technology Transfer Centres, Technology Incubators, Spin offs, Start ups will be supported **by means of other state programmes of infrastructure development that can be supported through the Agency for the Support of Research and Development** (hereinafter referred to as the "Agency")**.**

Beneficiaries of funds: organisations of the higher education sector, state sector of research and

development, business sector of research and development, not-for-profit sector of research and development.

8.1.1.2.3 Programmes and projects of the Agency for the Support of Research and Development

The Agency will continue to provide financial support for:

- **Research and development projects** that will pursue the research requirements of the research and development workers from the areas of the basic research, applied research and experimental development;
- **Agency programmes** within which support will be provided for the targeted research to be set by the Agency Presidium,
- **Participation of the Slovak organisations of research and development in the framework programmes of the EU for research, technological development and demonstration activities** (Seventh Framework Programme of the European Union for research, technological development and demonstration activities (hereinafter referred to as "FP 7") and FP 8), and in the **projects of bilateral science and technology cooperation and in international research centres.**

The Agency will provide financial support also for:

- **Projects of directed research** that will be consistent with the Agency priorities identified under section 6.1 of the present material,
- **State programmes** whose directions and content will be drafted by the Ministry of Education and approved by the Government of Slovak Republic,
- **State programmes of the infrastructure development** designed to support the foundation and initial stage of centres of excellence, centres of technology transfer, technological incubators, spin offs, and start-ups. The content of the state programmes of infrastructure development will be drafted by the Ministry of Education and approved by the Government of Slovak Republic.

Beneficiaries of funds: organisations of the higher education sector, state sector of research and development, business sector of research and development, not-for-profit sector of research and development, natural persons of research and development within the meaning of the Trade Act. .

8.1.1.2.3 Investment assistance for building major technical infrastructures

The Ministry of Education will create conditions for the provision of investment assistance for domestic and foreign investors to build major technical infrastructures, such as science and technology parks.

Beneficiaries of funds: domestic and foreign investors

The financial flows from the state budget to support science and technology via the Ministry are **demonstrated in Annex 4.**

8.1.2 Support of science and technology from the budget chapters of other ministries, other central authorities and the SAS

State budget resources for the support of science and technology will also be provided from the budget chapters of other ministries, other central authorities and the SAS as follows:

- Institutional support,
- Designated support.

8.1.2.1 Institutional support of science and technology through other ministries, other central authorities, and the SAS

a) Institutional support through other ministries and other central authorities will be provided to secure the performance of the activities:

- of the **state sectoral research institutes,** founded by the cited bodies and having the budgetary (fully subsidised) or contributory (partly subsidised) economic form.

However with a tendency of increasing the amount of designated support from the state budget these institutions set up in the state interest will have to supplement the institutional support by applying for funds from designated support via the announced public competitive calls.

Beneficiaries of funds: state sectoral research institutes with budgetary or contributory form of economic management set up by other ministries or central authorities.

b) Institutional support of science and technology through the SAS will be provided to ensure the performance of activities:

- of budgetary or contributory **institutes of the SAS** established by it.

Institutional support through the SAS will be implemented via VEGA, specified in more detail under Section 8.1.1.1.

Beneficiaries of funds: budgetary or contributory institutes of the SAS.

8.1.2.2 Designated support of science and technology through other ministries, other central authorities

The designated support from the state budget will be provided not only from the budget chapter of the Ministry but also from the chapters of other ministries and central authorities via a new category of so-called **"sectoral projects of research and development"** (hereinafter referred to as "sectoral project"). This category of designated support will be stipulated in the amendment of the Act No. 172/2005 Coll. and will enable sectoral ministries and central authorities to ensure the development of specific needs of the sector concerned through research and development.

Beneficiaries of funds: organisations of the higher education sector, the state sector of research and development, business sector of research and development, not-for-profit sector of research and development, natural persons of research and development within the meaning of the Trade Act.

The financial flows from the state budget to support science and technology via the budget chapters of other ministries, other central authorities and the SAS are demonstrated in Annex 4.

8.2 Support of science and technology from the Structural Funds of the European Union

Apart from the resources of the national budget**,** in the period of 2007 to 2013, the resources of the Structural Funds will be an **integral part of the public expenditure participating in the support of science and technology in Slovak Republic**, namely from:

- The European Regional Development Fund,
- The European Social Fund.

From the former fund, the resources will be provided via the Operational Programme "Research and Development" and from the latter via the Operational Programme "Education". The Ministry of Education shall be the Managing Authority for both operational programmes.

Beneficiaries of funds: organisations of the higher education sector, the state sector of research and development, business sector of research and development, not-for-profit sector of research and development, natural persons of research and development within the meaning of the Trade Act.

8.3 Support of science and technology from the business sources

Another source that will co-participate in supporting science and technology in Slovak Republic by 2015 will be the funding from the business sources. There will be a requirement that business sources take part, in addition to the state budget funding, in the solution of:

- State programmes,
- State programmes of infrastructure development,
- Agency projects,
- Agency programmes,
- Sectoral research and development projects,
- Investment assistance for building major technical infrastructures (hereinafter referred to as "investment assistance").

Beneficiaries of funds: organisations of the higher education sector, the state sector of research and development, business sector of research and development, not-for-profit sector of research and development, natural persons of research and development within the meaning of the Trade Act; domestic and foreign investors.

8.4 Support of science and technology from international sources

The resources from the international sources, particularly from the programmes of the European Union will be another source that Slovak research and development organisations will be able to apply to for funding.

In 2007 to 2013, the greatest volume of funding from the European programmes, around 54 million EUR, will be committed for the Seventh Framework Programme.

According to particular programme directions of FP 7 and the type of economic management of the Slovak research and development organisations, state budget resources will have to participate in the financing of FP 7 projects, and in the case of business research and development organisations, their own resources as well.

Beneficiaries of funds: organisations of the higher education sector, the state sector of research and

development, business sector of research and development, not-for-profit sector of research and development, natural persons of research and development within the meaning of the Trade Act.

8.5 Framework rules and criteria for the provision of support from the public sources

8.5.1 Framework rules and criteria for the provision of designated support from the state budget

In providing state budget funding through the designated support, the **following rules** shall apply[4]:

- the basic research shall be supported at 100%,
- the applied research shall be supported at 50%,
- the experimental development shall be supported at 25%

with additional rule that the **state budget expenditure in applied research and experimental development can in the following cases be raised by an amount of :**

- **10% at most,** where it involves the solution of an international research and development project,
- or **additional 10% at most,** where it involves a cross-border project provided the results thereof will be disseminated and made available,
- or **additional 10% at most**, where it involves the state aid provided to regions;
- and **additional 10% at most,** where it is provided to small or medium-sized enterprise.

The maximum amount of state aid, despite the allowances referred to above, in the case of:

- applied research cannot exceed 75%,
- in the case of experimental development, 50%, respectively.

The designated support from the public funds for research and development **will be provided to business research and development organisations pursuant to the Act No. 231/1999 Coll. on the state aid,** as later amended**.**

To promote cooperation in research and development of small and medium-sized enterprises with universities, organisations of state research and development sector (including the SAS) and the business research and development organisations, a new incentive will be put in place through the amendment of the Act No. 172/2005 for SMEs that will enable them to receive additional 5% from the state budget in case of the support for the applied research and experimental development. However, the basic condition for the 5% increase will be that the results of research and development will have to demonstrate measurable increase in the added value for the economic growth. In the case of applied research the maximum amount of state aid, in aggregate, cannot exceed 80%, and in the case of experimental development, 55%, respectively.

In the horizon by 2015, the **main objective in the designated support** through the main forms of support, namely

[4] Pursuant to the Act No. 231/1999 Coll. on the state aid , as later amended.

- State programmes,
- State infrastructure development programmes,
- Agency projects,
- Agency programmes,
- Sectoral research and development projects,
- Investment stimuli for building large technical infrastructure..

will be to achieve the synergic effect.

In conformity with this objective, the **main forms of support will be required to meet the following rules and criteria.**

8.5.1.1 State programmes of research and development

Framework rules for state programmes include:

- ✓ Through state programmes **ensure the fulfilment of the demands of the state** to develop certain economic or social areas of Slovakia via research and development,
- ✓ In formulating the content of state programmes to draw on the substantive priorities of research and development approved by the Government in the long-term plan,
- ✓ To combine the solution of **state programmes of infrastructure development** with the projects of **state programmes** which entails to link the support of the research theme with building and modernising of the technical infrastructure and the human resources of research and development,
- ✓ **Yet, the resources** for the solution of a **state programme** project **cannot be used in duplication** for the same purpose within the solution of a state programme of infrastructure development,
- ✓ The period of state programme implementation shall be 9 years, with 3-year control stages for their review and potential subsequent updating,
- ✓ **The results of the solution of a state programme must be used in the social or economic practice** – they must have a subscriber.

Framework criteria for the financial support of state programmes:

- ➢ The implementation of the state programme will **be ensured through the projects**, with a **duration of three to maximum four years,**
- ➢ Insofar as the results of the solution of a state programme must be exploited in social or economic practice, **the solution of the state programmes will be ensured by the projects of applied research and experimental development**,
- ➢ The research and development organisations from at least two different research and development sectors must be simultaneously involved – from higher education sector, state sector, business sector, or not-for-profit sector,
- ➢ A state programme project **must have a contractually confirmed subscriber of its results**,
- ➢ Insofar as the solution of a state programme must be ensured by the projects of applied research and experimental development, **co-financing of state programme projects from the resources of the subscriber and from commercial sources must be secured** alongside the state budget funding**, so as to get a 1:1 ratio of co-participation of these**

resources in the solution of a state programme - the state budget to the subscriber source and commercial resources**.**

8.5.1.2 State programmes of infrastructure development of the research and development

Framework rules for the state programmes of infrastructure development include:

- ✓ **To ensure the development of technical infrastructure** for research and development **in certain areas** with a view to creating basic conditions for the implementation of research and development primarily for the benefit of economic or social development of Slovakia;
- ✓ In order to obtain the synergic effects in the support of research and development, **support will be given to the development of technical infrastructure of research and development primarily in those areas that are also the areas of substantive priorities of research and development;**
- ✓ **The state budget resources will support the building of research and development technical infrastructure in a way that will avoid duplication** in Slovakia **in** the same area of research and development;
- ✓ Through the state programmes of infrastructure development, **support the setting up and the initial stage of organisations that will be responsible for the knowledge transfer** in economic or social practice;
- ✓ The research and development **technical infrastructure** built through the state programmes of infrastructure supported only from the state budget **must be publicly accessible to the research and development organisations of the higher education and state sectors;**
- ✓ Ensure building of the research and development technical infrastructure also from the business sources.

Framework criteria for the financial support of the state programmes of infrastructure development:

- ✓ The state programmes of infrastructure development **will be executed by means of projects** with a **duration of three to maximum four year;**
- ✓ **The technical infrastructure built in the initial phases from the state budget support must** in the ensuing phases of existence **have operations and modernisation ensured also from other sources than the state budget;**
- ✓ To **ensure co-financing of state programmes of infrastructure development also from the businesses sources,** in addition to the state budget resources, **so as to make co-participation of these two sources** - the state budget and business sources **at a ratio of 1:2, which should lead to constructing of the common technical infrastructure of research and development for the public and business sector of research and development;**
- ✓ **The contract** concluded for the solution of the project of state programme of infrastructure development supported from, both, the state budget and the business sources shall **establish the conditions for the use of infrastructure thus constructed by businesses and by the public sector organisations of research and developmen**t.

8.5.1.3 Programmes of the Agency for the Support of Research and development

Framework rules for the Agency programmes:

- through Agency programmes, **ensure financial support for the goals and objectives in research and development, selected by the Agency Presidium, in a line with the long-term plan,**
- **to submit to the Minister of Education for approval the draft programmes of the Agency, drawn up by the Agency Presidium,** on the basis of goals and objectives selected by it;
- Focus the Agency programmes particularly on the support of cooperation of the public sector (higher education sector and state research and development sector) with the business sector; support the transnational scientific and technical cooperation, support the human resources development in research and development, support the popularisation of science and technology in the society.

Framework rules for the financial support of the Agency programmes:

- **In accordance with the character of the programme, ensure financing of the Agency programmes also from other sources** than the state budget, namely **from the business resources;**
- **Ensure** differentiated **co-financing** of the Agency programmes designed to support technical infrastructure **from the business sources at 2/3** of the total cost of any Agency programme;
- In the case of the Agency programmes focused on a selected substantive research and development issue, **require** in the projects by which particular programme is implemented, the provision for a **contractually confirmed subscriber of the results.**

8.5.1.4 The Agency Projects for the support of research and development

Framework rules for the Agency projects:

- The Agency will support two types of research and development projects:
  - projects proposed by the investigators themselves, on the basis of their research requirements (within so-called the "general call")
  - and projects of directed research and development proposed by the investigators which must be consistent with the substantive priorities of research and development, approved in the long-term plan.

Framework criteria for financial support for both types of the Agency projects:

- projects of basic research shall be supported from the state budget at up to 100%,
- projects of applied research shall be supported from the state budget at up to 50%,
- projects of experimental development shall be supported from the state budget at up to 25%,
- in case the applicant for support for a project of applied research or a project of experimental development is a small, or a medium-sized enterprise, they can obtain increased funding from the state budget, in accordance with the criteria given under section 8.5.1,
- in the case of the projects of directed research and development, a subscriber of the results from the economic or social practice will have to be contractually provided.

8.5.1.5 Sectoral research and development projects

Framework rules for sectoral projects:

- Sectoral projects shall **ensure the solution of the specific needs of the development of the sector**;
- **Sectoral projects must be in compliance with the substantive priorities of research and development, as set out in the Sectoral Concept of the Directions and Support for Research and Development** to be developed by particular ministries or central authorities with a view to the long-term plan;
- **The substantive priorities of research and development** set out in the sectoral concept of the directions and support of research and development for **the solution of sectoral projects must be different** from the substantive priorities of research and development set out in the long-term plan,
- Ministries and other central authorities shall propose the **topics for the publication of the competitive call for sectoral projects,** with a proposal for their financial provision, under the coordination of the Ministry of Education;
- **The Ministry of Education shall develop a special methodological guideline for the process of selection, solution and control of sectoral projects** which will establish uniform rules for all ministries and other central authorities applicable to the solution of sectoral projects;
- **Results of the solution of sectoral projects must be used** in the social or economic practice.

Framework criteria for the financial support of sectoral projects:

- **The public competitive call published for the solution of sectoral projects** must be open to all organisations of research and development of the higher education sector, of the state sector, of the business sector and of the not-for-profit sector;
- **A Ministry or a central authority must have** committed resources for the support of sectoral projects **in their respective chapters for the publication of the public competitive call**;
- **The duration of** a sectoral project solution shall be maximum three years;
- A sectoral project **shall have a contractually confirmed subscriber of its results;**
- Alongside of the state budget resources, **co-financing will need to be secured also from other sources** (e.g. from business).

Table 4 Outline of the participation of the state budget and the business sources in the support for research and development through individual forms of support

Title of the form of support for R&D	**Total expenditure for the solution** (in % from the SB and BS)	
	Expenditure from the state budget (SB)	**Expenditure from business sources (BS)**
State programme of R&D	**50**	**50**
State programme of infrastructure development – support for technical	**34**	**66**

infrastructure		
ASRD Programme – support for technical infrastructure	**34 to 100**	**0 to 66**
ASRD Programme – support for human resources	**100**	**0**
ASRD Project (general call)	**25 to 100***	**0 to 75**
ASRD Project of directed R&D	**25 to 100***	**0 to 75**
Sectoral project of R&D	**25 to 100***	**0 to 75**

Abbreviations: R&D – research and development, **SB – state budget, BS –** business sources, **ASRD –** Agency for the Support of Research and Development,

Notes: ***** - in line with the rules for the support of projects of basic research, applied research, experimental development and the possibilities to increase expenditure on the project of applied research and experimental development (set out under section 8.5.1).

Detailed specifications of the rules and criteria for providing funding from the state budget for all forms of support for research and development set out above, will always be specified by the competent advisory bodies of the Ministry, or the Agency, the administrators of other budget chapters, namely by the R&D experts from all sectors, by state programmes councils, by state programme councils of infrastructure development, or by the Agency councils in the calls published for public competition. **At the same time, the provider of the state budget funding** (administrators of the budget chapter) **shall draw up the financial schemes establishing conditions** for providing state budget funding **to particular beneficiaries of budgetary, contributory, not-for-profit or business form of economic management.**

8.5.1.6 Investment assistance for constructing major technical infrastructures

Framework rules for the investment assistance:

- to build through **investment assistance major technical infrastructures,** such as science and technology parks;
- **the Ministry of Education shall provide investment assistance** for constructing technical infrastructures through investments assistance projects;
- for provision of the investment assistance the Ministry of Education shall draw up a **special methodological procedure** establishing the **criteria and rules of investment assistance provision;**
- **investment assistance** shall be provided **for supporting the start-up investment and for creating jobs,**
- provision of investment assistance **shall be approved by the Government of the SR and the eligibility of conclusion of the contract for the provision of investment assistance shall be approved by the European Commission** that will check non-violation of the principles of market conditions.

Framework criteria for the provision of investment assistance:

- investment assistance **shall take the form of :**
    - **a subsidy** for the procurement of tangible and intangible fixed assets,

- **income tax allowances,**
- **contribution for newly created jobs,**
- **conveyance or swap of real property** for a price lower than the general value of the property,

- **procurement of tangible and intangible fixed assets worth minimum 50 million SKK, where 50%** at least must be covered by the own equity of the legal person or the own means of the natural person - entrepreneur,
- of the total number of employees **at least 60% will be employees with university education,**
- **investment assistance shall be provided on the basis of a contract** between the Ministry of Education and the beneficiary.

8.5.2 Framework rules and criteria for the provision of designated support from the Structural Funds

Until 2013 the funding from the Structural Funds for research and development will be provided under two Operational Programmes, the OP "Education " and the OP "Research and Development."

The principal rule in the provision of funding under the Operational Programme "Research and Development" is to provide it preferentially for the substantive priorities of research and development approved by the Government of the Slovak Republic in the long-term plan.

Accurate description of the rules and criteria of funding provision and the financial schemes for particular beneficiaries are given in the manuals for both operational programmes.

8.5.3 Framework rules and criteria for the provision of designated support under FP 7

From the year 2007 the FP 7 resources shall be provided according to the rules and criteria approved by the European Commission for specific programmes concerned. Equally the rules and financial schemes have been published for the provision of FP 7 resources to particular beneficiaries.

8.6 Complementarity of funding in the support for research and development

In the light of the target to gain synergic effect, by 2015, in the designated support (combining the means from different sources to promote comprehensive creation of environment for the solution of substantive priorities of research and development), **the complementarily combined funding shall be provided for:**

- ✓ **The projects funded under FP 7** with the funding from the **Operational Programme "Research and Development",**
- ✓ **The state programmes** with the funding granted for the **state programme of infrastructure development.**

Both cases of **complementary combination of funding** from different sources shall involve combing resources **for the provision of technical infrastructure and human resources with**

those for the solution of substantive problems of research and development.

Complementarity of combined funding means to use the funding from two different sources in a complementary fashion – but this does not imply co-financing the same part of the project or the same project of research and development from two different sources of public support.

The basic rules in the complementary combination of funding provided for the combined forms of support will include:

- to secure financial support of two different parts (1. substantive solution and 2. hardware and equipment and support of human resources) of the same project of research and development from two different public sources of financing with a view to making comprehensive provision for the solution of the same substantive priority of research and development,
- to secure complementary combined funding provided for substantively directed research and development projects with the funding provided for the projects designed to support technical infrastructure of research and development or human resources in research and development,
- to eliminate duplication in the support from two different public sources of financing for the same part of the project of research and development or for the whole project,
- complementary funding from two different public sources shall be provided on the basis of a public tender (for every source a separate public tender) that will be published by a call focused specifically for the complementarity of sources in the support for research and development projects,
- expert assessment for the purpose of selection for the provision of funding from two different sources (FP7 and resources of the Operational Programme "Research and Development") for complementary financing shall be subject to the rules of two different processes, prescribed for the relevant financial source,
- complementary funding for the project from two different sources (FP7 and resources of the Operational Programme "Research and Development") shall be provided by means of two different contracts because the funds shall be provided by two different providers and each financial source has its own financial rules,
- in complementary financing of a research and development project from two different financial sources, monitoring and control of the use of these funds shall be subject to two different sets of rules prescribed specifically for the relevant source,
- By means of the Central Information Portal for Science, Technology and Innovation the Ministry of Education shall keep records of complementarily supported projects.

The basic procedure for the provision of funding for a research and development project financed from two complementary sources:

- the resources from the Operational Programme "Research and Development" shall be provided as complementary funding for:
    - the projects already receiving funding under FP 7 in specific programmes "Cooperation", "Ideas", "People, " "Capacities", „Non-nuclear actions JRC", "Euratom",
    - for the preparation of FP 7 projects by which applications will be made under competitive call for projects published by the Commission for the support from FP 7,

- the resources of the state programmes of infrastructure development shall be provided as complementary funding for the already financed projects
    - of the state programmes,
- the project which has already been financed under the FP 7 anf for which additional support is requested (under a published competitive call) from the funds of the Operational Programme "Research and Development", will be registered as Part 1 of the project,
- equally a state programme project for which additional support will be sought under a published competitive call from the state programme of infrastructure development shall be registered as Part 1 of the project,
- in the provision of funding from the Operational Programme "Research and Development" for a FP 7 project already financed, this funding will be committed exclusively for the provision of Part 2 of the project and for this second part of the project a separate contract shall be concluded,
- in the provision of funding for a state programme project already financed, this funding will be committed exclusively for the provision of Part 2 of the project and for this second part of the project a separate contract shall be concluded.

Complementarity of the support for research and development is demonstrated in Annex 4.

9. INTERNATIONAL SCIENTIFIC AND TECHNICAL COOPERATION

From membership of the Slovak Republic in the European Union a challenging task stems for science and technology in the area of international scientific and technological cooperation, which is to tackle the problems following for the Slovak research and development organisations out of the common European competitive environment – to be an equal competitive partner for the organisations in the other Member States. For Slovak organisations to be equal competitive partners they need to ensure qualified human resources, modern technical infrastructure and also adequate domestic financial sources whose co-participation is required by the European Commission in the solutions of the EU programmes for research and development.

Equally the international scientific and technological cooperation following out of bilateral agreements on cooperation in science and technology, signed by the Government, and out of the SR membership in transnational research centres, is determined not only by the high-quality research and development infrastructure (human resources and technical infrastructure) but also by adequate resources in Slovakia that are required to support both the mobilities in case of bilateral cooperation and the research participation itself of Slovak organisations in the projects of bilateral cooperation and in the activities of transnational centres.

Inadequate funding from the state budget required for active participation on an equal footing of Slovak organisations of research and development, in all forms of international science and technology cooperation, is a major problem that has been persisting in the support of international scientific and technological cooperation on long term. The ever-increasing annual membership fees of Slovakia in international organisations, which from 1 January 2007, are covered by the Ministry of Education from its budget chapter (until 1 January 2007 these fees were covered by the Ministry of Foreign Affairs of the SR) and the mandatory 25% participation of national resources in the support of successful projects under FP 7, executed by the organisations of public sector, give

rise to unbearable increases in the demands on the state budget resources and place the Ministry of Education before an uneasy task to identify the priorities in the area of international scientific and technological cooperation in accordance with the state budget resources available in its budget chapter.

The essential criterion identifying the priorities in the area of international science and technology cooperation will be the support for such participation of Slovak research and development organisations that would generate benefits primarily for the economic or societal development of the Slovak Republic.

Priorities in the area of international science and technology cooperation shall include:

- to reimburse from the budget chapter of the Ministry the annual membership fees in all international organisations and European programmes and activities to which the Slovak Republic is a party,
- ensure funds in the budget chapter of the Ministry to carry out the research cooperation within the governmental bilateral and multilateral agreements signed of scientific and technological cooperation,
- by 2015 raise the resources to ensure sustainable development of all specifications of groups of science and technology disciplines in Slovakia from the resources of FP 7 and FP 8 regardless of the substantive priorities of research and development, approved in Section 6.1 of the material,
- contribute to the 25-pecent financial participation of national resources required for the support of successful projects of FP7, executed by the organisations of public sector, from the budget chapter of the Ministry in proportion to the increase in expenditure in the relevant budgetary year,
- create conditions in the Agency for the improvement of administrative and technical assistance in the preparation of projects seeking support under the Sevenths Framework Programme,
- cooperation with the countries that are of priority political interest for the Slovak Republic, in accordance with the objectives of the foreign policy of the Slovak Republic, in collaboration with the authorities and organisations of the EU and the NATO,
- new memberships of Slovakia in the European organisations, centres, and activities will be considered and analysed to ascertain their economic and societal benefits for the development of Slovakia and the demands of their financial requirements for the support from the budget chapter of the Ministry.

With regard to the support for the projects of FP 7 and their potential support also from the Structural Funds, the main objective will be to develop such grant schemes that will allow simultaneous financial support of projects from the resources of FP 7 and from the Structural Funds.

10. EVALUATION OF RESEARCH AND DEVELOPMENT

The state science and technology policy must respond to the increasing significance of the evaluation of research and development in the countries of the EU. It must be emphasised that it is a demanding process, which must be undertaken continuously and at regular intervals. The evaluation process for research and development comprises complex and demanding activities that have to be

conducted according to a uniform methodology. The basic principles of the evaluation must include a multi-criteria approach, a demonstrable professional competence, concreteness, transparency independence, and objectivity.

10. 1. The evaluation of the state of research and development

Based on the above, **there will be an overall evaluation of research and development undertaken annually in the Slovak Republic according to the methodology** developed by the Ministry of Education in working with other budget chapters, **which shall set the criteria according to the indicators applied in the EU countries, making use of the evaluation of the research and development to be conducted by reputable world professional institutions.**

Two basic kinds of indicators are used for the evaluation of research and development in the EU countries:

a) **individual indicators.**
b) **compound indicators.**

Evaluations undertaken by reputable world professional institutions are also used for the evaluation of research and development in the countries worldwide.

Individual indicators in the research and development are published in yearbooks of national statistical indicators, of Eurostat, the European Commission, OECD and some other world institutions, such as the World Economic Forum. Individual indicators can be categorized into:

a) **indicators for the evaluation of inputs – sources of research and development,**
b) **indicators for the evaluation of the results of research and development and their impacts,**
c) **indicators for the evaluation of the use of research and development.**

Compound indictors are created by weighted aggregation of several individual indicators. They evaluate a certain multidimensional phenomenon in a comprehensive way using a single parameter (score) and permit to compare the level of different states in this area. The disadvantage is that the research and development is not the only factor determining the level of that area. Compound indicators can be categorised into:

a) **indicator of investments in knowledge,**
b) **indicators of science and technology,**
c) **indicators of innovation activity.**

Particular countries of the world mutually compare the **evaluations of research and development undertaken by reputable professional institutions** and rank them as:

a) **Evaluation of competitiveness** which is annually published by the World Economic Forum,
b) **Evaluation of competitiveness** which is annually published, from 1989, by the Institute for Management Development,
c) **Monitor of business environment**, a programme designed to describe and analyse the business process which is jointly coordinated by the Babsom College, MA, USA and the London Business School, London, UK.

Both two types of basic indicators and the evaluation by reputable professional institutions are described in more detail in Annex 4. .

The objective in the area of evaluation of research and development will be to put in place the evaluation of the state of research and development according to the above indicators. The execution of evaluation of research and development in Slovakia according to the indicators refereed to above will allow to comprehensively compare the state of research and development with other countries of the world and identify the action necessary to improve the conditions of research and development in Slovakia.

10.2 Evaluation of the components of the research and development system

Besides the evaluation of the overall state of research and development a special attention will need to be devoted to the evaluation of partial processes and components of the research and development system. **It will be necessary to continue with annual evaluation of all kinds of designated support.**

In order to ensure the requisite quality of research and development supported from the public sources it will be necessary to put in place a basic common framework for the evaluation of all Slovak research and development organisations.

Within the evaluation of all types of designated support provided from the public sources, substantive implementation will be annually evaluated of the state programmes of research and development, the state programmes of infrastructure development, the projects of research and development supported by the Agency, the sectoral research and development projects, the projects of structural funds and the Seventh Framework Programme. Of particular importance will be the evaluation of final results of the solution of the cited types of tasks of research and development. The Ministry of Education, in cooperation with the other budget chapters shall elaborate the **methodology that will set the criteria and procedures for progress and final evaluation of the cited types of designated support, its substantive benefits for the economic and societal development of the country.**

The research and development organisations that will receive funding from public sources will have to conduct their evaluation at 4-year intervals, with the participation of the Ministry's officials and other external experts. **The basic framework of the evaluation of a research and development organisation will be specified in the methodology** to be developed by the Ministry of Education in collaboration with the relevant experts. The basic evaluation framework will include the accreditation criteria of the research and development organisations. Further evaluation criteria will take into account the differences between institutions of particular research and development sectors, and therefore will be set as framework criteria, and it will be fully in the competence of particular sectors to decide what other criteria of evaluation they will establish that will take account of the specifics of their sector. The criteria of evaluation of the organisations of research and development will include not only the evaluation of research and development undertaken by them but also the evaluation of the effective use of public source funding, as well as the capacity of the organisation to secure funds from the private sphere, based on the results achieved.

With a view to organisationally secure the process of the evaluation of the state of research and development in Slovakia according to internationally accepted indicators, and the process of the

evaluation of the organisations of research and development, including the evaluation of universities and their research and development results, a **centre for the evaluation and certification of research and development will be established.** This centre will award the organisations of research and development certificates of competence to carry out activities in the area of research and development on the basis of the evaluation.

11. POPULARISATION OF SCIENCE AND TECHNOLOGY

Currently one of the key problems of science and technology – not only in Slovakia but in other countries of the EU as well, is the insufficient perception by the public of their significance as factors determining the economic and societal development of the country. Hence popularisation of science and technology that will secure the awareness of the significance by the public will be one of the key objectives of the state science and technology policy. It will also be necessary to systematically improve the perception of science and technology by the community, as one of the main building blocks to increase the standard of living of citizens and the general development of the society.

The strategic objectives in the popularisation of science and technology in the community will include:

- increasing the understanding of the world of science and technology by the general public,
- improving the approaches to the clarification of objectives and results of research and development,
- overcoming the communication barriers between:
  - ✓ research and development workers on the one side, and the representatives of the decision making sphere at national and regional levels, on the other,
  - ✓ both sides referred to above and the broad public,
  - ✓ research and development workers on the one side, and the representatives of the business sphere exploiting the results of research and development, on the other.

The specific objectives will include:

- raising the awareness of the public of the tasks of science and technology and the significance of applying their results in practical life,
- boosting the interest of young people in science and technology and in the scientific career and action in research and development by means of increased promotion of the results of secondary school and university students technical activity,
- improving the communication skills of research and development workers,
- increasing the prestige and the societal recognition of the vocation in research and development,
- encouraging participation of the public in the action in science and technology by means of a more intense dialogue.

Beside the financial support for popularisation granted to particular organisations of research and development through the Agency programme for the popularisation of science and technology, these objectives will, at national level, be implemented also by the **establishment of the National Centre for the Popularisation of Science and Technology (hereinafter referred to as the "National Centre"**, which was approved by the Resolution of the Government No. 103/2007 for the material titled the „Strategy of the popularisation of science and technology in the society". **The National Centre will be an integral part of the** existing

organisation directly managed by the Ministry – the **Centre of Scientific and Technological Information,** which is a contributory organisation, receiving a contribution allocated from the resources of the item Coordination of cross-cutting activities of the state science and technology policy of the National Programme for the Development of Science and Technology, in the budget chapter of the Ministry. The contribution provided by the Ministry of Education to the Centre of Scientific and Technological Information will include also the funding to ensure the activity of the National Centre; its existence shall not entail increased demands on the state budget because the material of the "Strategy of the popularisation of science and technology in the society" was approved by the Government of the Slovak Republic with a proviso that the objectives and tasks contained therein will not make additional demands on the state budget and will be implemented within the binding limits of the state budget chapter of the Ministry of Education of the SR for the year 2007 and the ensuing years. The National Centre will discharge important tasks of national character in the area of popularisation of science and technology, which the organisations of research and development cannot ensure themselves. This will involve in particular:

- ✓ organisation of permanent expositions on major results of research and development in the Slovak Republic and their benefits for the development of Slovakia and the history of science and technology in Slovakia,
- ✓ organisational provision for the popularisation of science and technology in the general sense in the media and bringing in timely information on the benefits of the results of research and development,
- ✓ organisation of scientific cafes,
- ✓ annual organisation of the Week of Science and Technology in Slovakia,
- ✓ awarding the personalities and organisations of science and technology.

Popularisation of science and technology will contribute to awareness raising of the significance of science and technology for the development of the economy and the society, with the aspect of a more positive perception of the occupation of the worker in a research and development organisation and a more positive perception of the need to increase spending from the state budget on science and technology.

12. MONITORING THE STATE SCIENCE AND TECHNOLOGY POLICY

In order to ensure conditions for a successful functioning of the science and technology system as a development factor not only at national level but at the European level as well, all objectives and goals of the "Long-term plan of the state science and technology policy by 2015" have to be continuously monitored and periodically reviewed and subsequently updated, thus enabling science and technology to continually fulfil its role in the period by 2015. For this reason it will be necessary to produce **regularly the Annual Report on the implementation of the objectives and goals of the long-term plan, with a proposal for their updating.**