

III.

Reform of the System of Research, Development and Innovation in the Czech Republic

1. Starting points for the Reform

1.1. Vision – the main goal of the Reform

To create an innovative environment through reforming the system of research, development and innovation in the Czech Republic in order to be held true that “Science makes knowledge from money, innovation makes money from knowledge.”

This main objective of the Reform may also be formulated in a different way – public funds invested into basic research must bring a true new knowledge (and not only in the context of the Czech Republic, but in comparison with other world). The public funds invested into the applied research, development and innovation must bring concrete economic or other social benefit from their realization.

1.2. Objectives of the Reform

The Reform aims on achieving seven main objectives:

- (1) To simplify the support of research and development /hereinafter referred to as “R&D”/ - to support institutions according to the results achieved and teams according to the projects undertaken.
- (2) To reduce significantly the number of budgetary chapters (22) under which the Czech R&D is supported and simplify the paperwork requirements.
- (3) To support excellence in research, give it a preferential treatment, and use its results for innovation.
- (4) To condition the programme support of R&D upon the cooperation of public research with users of R&D results based on co-financing from public and private resources.
- (5) To introduce more flexible organisational structures of public research.
- (6) To provide experts for research, development and innovation.
- (7) To engage the Czech Republic intensively in the international collaboration in research, development and innovation.

1.3. Reasons for the Reform

The main reasons for the Reform are:

1. So far very low contribution of research, development and innovation for the economy and society of the Czech Republic.
2. The current failing system of support to research and development, which is no longer able as a whole to provide the resources for research and development, neither use the opportunities offered by EU funds for this field.
3. The continuing atomisation and fragmentation of the Czech research, support to ordinariness at the expense of excellence and factual absence of any priorities, which leads to further slipping behind the world in many disciplines.

1.4. Principles of the Reform

The whole Reform is based (see the main reasons) on three principles.

1. As large as possible simplification of the structure of the state R&D support system, reduction in the number of budgetary chapters and lowering of paperwork burden.

2. The support of excellence and high quality research, development and innovation and the transfer of decision-taking about the ways of accomplishing the best results from the ministries to organisations in the case of the institutional support, and professional agencies – the Grant Agency of the Czech Republic /hereinafter referred to as “GACR“/ and the Technology Agency of the Czech Republic /hereinafter referred to as “TA CR“/ in the case of the targeted support.
3. The support of mutual cooperation of research organisations and mainly their cooperation with enterprises through the use of economic instruments – such conditions of support granting in order to increase the benefits of research, development and innovation to the economy and society in both short- and long-term.

2. Interconnection of research, development and innovation

Main goal: To create an innovative environment through reforming the system of research, development and innovation in the Czech Republic in order to be held true that “Science makes knowledge from money, innovation makes money from knowledge.”

2.1. Establishing legal conditions for support of innovation

By amendment to Act No.130/2002 Coll. and its implementing regulations, the possibilities of supporting the research, development and innovation allowed by the Community Framework will be introduced into the Czech legislation. Particularly following spheres will be modified (differently from the targeted support for research and development):

1. Definition of innovation.
2. Conditions for supporting innovation.
3. Permitted amount of support.
4. Ownership of results and rights of their use.

2.2. Operational Programmes Research and Development for Innovation, Enterprise and Innovation, Education for Competitiveness, Prague – Competitiveness, and Prague – Adaptability

All five operational programmes form an integrated system with mutual links and synergies. The conditions for providing mutual links between the Operational Programme Enterprise and Innovation /hereinafter referred to as “OP EI”/ and the Operational Programme Research and Development for Innovation“ /hereinafter referred to as “OP RDI“/ are set forth in a document approved by the European Commission /hereinafter referred to as “EC”/ and worked into OP EI and will be also worked into OP RDI in compliance with the synergies approved by EC. Mutual links between these five operational programmes, particularly with a view to the interconnection of education, research, development and innovation and coordinated use of state budget funds for research and development, will be consistently promoted throughout the programme period, mainly in:

1. synergies between operational programmes – mutual relationship of projects in various programmes and calls.
2. implementation of operational programmes – similar system will be introduced primarily for simultaneously prepared and consequential projects.
3. conditions and calls for operational programmes.
4. monitoring the system – for both the coordination and management and in relation to the Information System for research, development and innovation in accordance with law.

2.3. Preparation for the period after 2015

In the next EU financial period 2014 – 2020, the Czech Republic will gradually become a pure payer because the massive support from EU sources will terminate also in the field of research,

development and innovation The Czech Republic must be prepared for this period sufficiently in advance; besides the legislation changes (see [2.1.](#)) the moves will be as follows:

1. Research, development and innovation will be taken as one sphere, from the preparation of the proposed state budget expenditures to information on the use of R&D results. The area of innovation will be supported in the same way and by the same instruments as research and development. (with specifics set forth in the Community Framework).
2. A joint National Research, Development and Innovation Policy will be established for the period after 2010, for which the Research, Development and Innovation Council will be responsible (and not two bodies as at present – the Ministry of Education, Youth and Sport /hereinafter referred to as “MoEYS”/ for the “science” policy and the Research and Development Council /hereinafter referred to as the “Council”/ for the “innovation” policy.
3. The competence of the current Research and Development Council will be expanded by law to become the Research, Development and Innovation Council (see [4.1.1.](#)).
4. Like in the area of research and development so far, information about the state R&D expenditures and accomplished results (Information System for Research and Development) will be made publicly available also as far as innovation is concerned; the existing system, however, will be expanded by the innovation support sphere.
5. Upon the beneficiaries of the targeted state support of applied research and development (applicants for the projects in R&D programmes) the law will impose an obligation to produce evidence that there is a system in place for the intellectual property rights protection, and transfer and commercialization of results.
6. By amending Act No. 130/2002 Coll., the protection of the intellectual property results and their use will be finalised so that they correspond with both the Community Framework and particularly the efforts to create a pro-innovative environment in the Czech Republic.
7. Research, development and innovation will be substantially more than ever linked with the university education that will gain importance mainly after 2015. Therefore the Reform deals also with these issues (e.g. see [8.2.](#)) so that its benefit includes also the increased level of education of the Czech society.

3. The R&D support system

Objective (1): Simplify the R&D support – support the institutions according to their results, teams by their projects.

3.1. Targeted R&D support

3.1.1. Public tenders in R&D

1. For the whole research and development (with the exception of four cross-sectional R&D areas - see [3.3.](#) and three sectoral R&D areas – see [3.4.](#)) the public tenders in R&D will be carried out, similarly to other countries, by two agencies as follows:
 - a) field of basic research – GA CR – see [4.1.2.](#),
 - b) field of applied research, development and innovation – TA CR - see [4.1.3.](#)
2. Respective departments will be responsible for development of individual sectors and related preparation of programmes of applied research and development in order to really ensure that R&D needs for given sectors are met. Like today, all departments will submit draft versions of their programmes to the Government for approval accompanied with a compulsory opinion by the Council, and newly by TA CR, as well.

3. The realization of the Government-approved programme, i.e. the public tender itself for the selection of projects; their control in the process of solution, etc., and the related paperwork will be carried out in a single one agency – TA CR. TA CR will also evaluate the fulfilment of programme targets and achieved results and inform both the Council and respective departments submitting the draft programmes to the Government (see [6.1.](#)). The obligations of providers (TA CR, etc.) defined under EC legislation (especially the notification duty) have not been changed by the Reform proposal.

3.1.2. Public contracts in R&D

1. The public contracts in R&D serving the needs of research and development itself will be preserved.
2. In addition, public contracts in cross-sectional R&D areas (see [3.3.](#)) and sectoral R&D areas (see [3.4.](#)) will be preserved for provision of public services and support of innovation contained herein as is usual in other countries.
3. The public contracts in R&D in other spheres, if they have standard R&D outputs (e.g. results projected into legal regulations, standards, directives, and non-legislative regulations binding within the competence of each respective provider) will be realized by TA CR after the programme is approved by the Government.
4. Some public contracts in R&D often substituting the work of ministries, the result of which are reports or data for the work of respective departments, etc., are not research and development and can no longer be covered under the R&D expenditures.

3.2. Institutional R&D support

The proposed system of institutional R&D support is linked with the targeted R&D support model.

1. The institutional support to departments will be allocated at the level of budgetary chapters according to the results of research organisations within their competence achieved over the past five years (see [5.2.](#), point 1). Within the respective budgetary chapters, it will be possible to modify the allocation of funds on the basis of a more detailed evaluation of research organisations using the internationally recognised methodologies, the results of which will be published.
2. The institutional support of specific research in institutions of the universities (hereafter higher education, i.e. that part of research that is immediately connected with education and in which the students participate) will be replaced by a targeted support granted by MoEYS (see [8.2.](#)).
3. Functions of bodies fulfilling the roles of founders of higher education institutions and institutions of the Academy of Sciences of the Czech Republic /hereinafter referred to as “AS CR“/ will be preserved, as well as the possibility for other types of institutions to get an institutional support upon the fulfilment of pre-defined conditions.
4. The conditions for granting an institutional support to research organisations will be particularly as follows:
 - a) Legal definition of a “research organisation“ corresponding with the EU legislation, namely the Community Framework (and amended acts, further to the Reform, namely Act Nos. 130/2002 Coll., 341/2005 Coll., 283/1992 Coll., 111/1998 Coll. and others).
 - b) The given institution will have had reported results in R&D for the past five years (results of researchers working in the institution in the last year).
 - c) If the institution conducts a business activity, i.e. offers its products or services on the market, it must comply with the conditions of the Community Framework.
5. Upon fulfilment of the above conditions, the competent provider (see [4.2.2.](#)) will allocate to the research organisation institutional funds in an amount corresponding with the achieved results (see [3.2.](#) par.1), but unlike today’s practice without regard to the amount of funds spent by the organisation on achieving these results.

3.3. Cross-sectional R&D spheres

There are four R&D fields having a cross-sectional character and therefore they will be supported, both institutionally and targetedly, always as single unit.

3.3.1. International collaboration in R&D

1. The international collaboration of the Czech Republic in R&D will remain under the competence of MoEYS that will establish:
 - a) A long-term interdepartmental concept that will enable to solve this issue falling also under other support providers (the Ministry of Foreign Affairs /hereinafter referred to as “MoFA”/ and the Ministry of Defence /hereinafter referred to as “MoD”/, etc.) in the form of cross-sectional R&D programmes.
 - b) Factual (administrative) provision of this issue, including the activity of an interdepartmental commission composed mostly of external experts.
2. The present exceptions (the support of the Czech Republic’s commitments in R&D through some other budgetary chapters) will be reviewed and if not prevented by formulation of a given commitment, they will be supported from R&D expenditures in the chapter of MoEYS.
3. On condition of strengthening the Czech research, development and innovation and their results the co-financing of operational programmes of MoEYS (OP RDI and OP EC) and of MoIT (OP EI) will be preserved wherever these are R&D expenditures.
4. The issue of co-financing the R&D expenditures in the Operational programme Prague - Competitiveness will be solved so that the applicants have the same conditions as in other operational programmes.

3.3.2. Security R&D

Security R&D will be coordinated and supported from the budgetary chapter of the Ministry of Defence /hereinafter referred to as “MoD”/ that will establish:

1. A long-term interdepartmental concept that will enable to solve this issue falling also under other support providers (among others the Ministry of Justice /hereinafter referred to as “MoJ”/, partly the State Office for Nuclear Safety /hereinafter referred to as “SÚJB”/, the Czech Mining Office /hereinafter referred to as “ČBÚ”/ and others) and involvement of research organisations (public research organisations /hereinafter referred to as “PRIs”/, public higher education institutions /hereinafter referred to as “PHEIs”/ and others) by form of cross-sectional R&D programmes.
2. Factual and administrative provision of this issue, including the activity of an interdepartmental commission composed mostly of external experts.
3. Specifics of security R&D (this is an area of research and development, where the state or regions are the only users of the results) enabling the use of results for the application sphere (industry and other branches), too.

The solution of problems falling so far under the competence of the Security Information Service /hereinafter referred to as “BIS”/ and the National Security Authority /hereinafter referred to as “NBÚ”/ will be with regard to their specific focus and tasks provided by them also in the future, but outside the scope of R&D. Since 2010 the expenditures for it will be transferred from the expenditures intended on R&D to expenditures on operations.

3.3.3. Applied R&D of national and cultural identity

The applied R&D of national and cultural identity will be coordinated and supported from the budgetary chapter of the Ministry of Culture /hereinafter referred to as “MoC”/ that will establish:

1. A long-term interdepartmental concept that will enable to solve this issue falling also under other support providers and involvement of research organisations (PRIs, PHEIs and others) by form of cross-sectional R&D programmes, in the solution of which also the users of R&D results will participate.
2. Factual and administrative provision of this issue, including the activity of an interdepartmental commission composed mostly of external experts.
3. Specifics of the applied R&D of national and cultural identity, where the state is primarily responsible. It is a field of R&D ensuring practical use of basic research knowledge in humanities and social sciences (focused on the national-oriented knowledge) for R&D of new products, procedures or services, the interdisciplinary approach and the collaboration of research organisations with enterprises or other users of R&D results.

Other applied social and economic research, especially research and development realized under public contracts, will be ensured within TA CR (see [4.1.3.](#)).

3.3.4. Support of large R&D infrastructures

1. With regard to close links to international cooperation (e.g. ESFRI) and OP RDI, the MoEYS competencies will encompass also the support of large infrastructures (see [5.1.](#)).
2. Building and/or activity of large infrastructures will be supported under long-term specific Government-approved programmes ensuring their support in a long term.
3. One of the long-term specific programmes in support of large R&D infrastructures will be the National Research Programme III that will ensure operation and activity of capacities built under OP RDI.

3.4. Sectoral R&D

Three R&D areas have a sectoral character, but at the same time they are so specific that they cannot be effectively supported through TA CR like other sectoral research and development.

3.4.1. Applied agricultural R&D

The applied agricultural R&D will ensure this field of research and development where in compliance with the EU legislation the applied R&D in agriculture and fishery can be aided by one-hundred-percent state budget subsidy. The applied agricultural R&D will be supported by the Ministry of Agriculture /hereinafter referred to as “MoA”/ that will establish:

1. A long-term concept increasing at the same time the involvement of research organisations (PRIs, PHEIs, and others).
2. Factual (administrative) provision of this issue including the activity of an interdepartmental commission composed mostly of external experts.
3. Links to the use of EU funds, which are different for this sector, too.

3.4.2. Applied defence R&D

The applied defence R&D will ensure this area of research and development where the state is user of the results; it will be supported by MoD that will establish:

1. A long-term concept increasing at the same time the involvement of research organisations (PRIs, PHEIs, and others) and enabling the use of results for the application sphere (industry and other sectors),
2. Factual (administrative) provision of this issue, including the activity of an interdepartmental commission composed mostly of external experts.

3.4.3. Applied healthcare R&D

The applied healthcare R&D will ensure this part of research and development where the prepared changes will be primarily solved under the public health reform and supported by the Ministry of Health /hereinafter referred to as “MoH”/ that will establish:

1. A long-term concept increasing at the same time the involvement of research organisations (PRIs, PHEIs, and others) and enabling the use of results for the application sphere,
2. Factual (administrative) provision of this issue including the activity of an interdepartmental commission composed mostly of external experts.

Just about one half of the existing expenditures spent by MoH on research and development has character and outputs typical of basic research like in other countries, and therefore it will be purpose-bound and granted by the Grant Agency of the Czech Republic.

4. State administration in R&D&I

Objective (2): To reduce significantly the number of budgetary chapters (22) under which the Czech R&D is supported and simplify the paperwork.

The proposed arrangement of the state administration in R&D&I and the number of budgetary chapters are based upon the system of R&D support and are necessary condition for efficiency of this system (see [Part 3](#)).

4.1. R&D&I bodies

4.1.1. Research, Development & Innovation Council

1. Competence of the Council

The present (or long-lasting, respectively) state will be enacted – the Council will have both the existing competencies under Act No. 130/2002 Coll. (R&D expenditures in CR, evaluation of R&D and its results, assessment of draft programmes, IS R&D, formulation of R&D priorities, preparation of innovation policy) and newly the responsibility for compilation of a new research, development and innovation policy, preparation of laws and other legal regulations, realization of R&D priorities, realization of measures in the field of innovation, etc. Already today, the Council is not de facto an “advisory” body, but it has become a body responsible for meeting the above tasks.

2. Composition of the Council

With a view to the Council’s competencies, its composition will be adapted. The Council will have 17 members – the chairman (the Prime Minister or the Deputy Prime Minister), 8 members of basic research, 8 members of applied research, development and innovation. Part of them will be prominent experts (nomination by selection from organisations of respective focus); others will be representatives of R&D bodies and institutions.

3. Provision of the Council’s activity

It results from the proposed competencies of the Council that it is necessary to change its legal form and position in order to ensure its activity and the tasks it has to fulfil. The Council will be established by amending Act No. 130/2002 Coll. that lays down its legal form, way of financing, scope of activities, duties, membership, proceedings, appointment of the Chairman, and labour-law relationships. The particular technical, organisational and expert provision of the Council’s activity will be ensured by the Secretariat and professional advisory bodies of the Council (the expert commissions). For example, the legal form of a public corporation seems to be a suitable model for the proposed structure and it is likewise used for similar legal entities ensuring execution of public administration in their own competencies under a special regulation.

4. Expert commissions of the Council

The expert commissions of the Council will not have only one task set by law as today - the preparation of main long-term directions of research /hereinafter referred to as “MLDR”/ which, however, were of no use in practice. The expert commissions will have clearly defined tasks and activity targets (preparation and implementation of R&D priorities – e.g. compulsory evaluation of draft versions of programmes and programme results, etc.). The Council will retain the possibility of appointing other advisory bodies.

4.1.2. Grant Agency of the Czech Republic

1. In principal, the tasks and position of the Grant Agency of the Czech Republic as described in Act No. 130/2002 Coll. will be preserved.
2. There will be a change in the system of draft projects evaluation with a significant differentiation in evaluation of individual drafts in order to chose the best ones.
3. On the ground of a public discussion, GA CR also modifies the rules for participation of workers from institutions filing the draft projects for evaluation in order not to raise mostly unjustified suspicion of an influenced evaluation.
4. The GA CR Scientific Council will be established and the focus of individual departmental commissions re-evaluated after the foundation of TA CR. Likewise with TA CR, the amendment to Act No. 130/2002 Coll. will anchor the possibility to collaborate with foreign grant agencies.

4.1.3. Technology Agency of the Czech Republic

The Technology Agency of the Czech Republic (TA CR) as the organisational unit of the state and budgetary chapter will be established by amending the Act No. 130/2002 Coll. Similarly as in case of GA CR, its Presidium will be appointed by and responsible to the Government.

TA CR will especially:

1. support the projects in applied research, development and innovation that are to be used in practice;
2. support, for the whole Czech Republic, the projects in applied social economic research intended to meet the state administration's needs that will be realized under public contracts after the applicable programme is approved by the Government;
3. provide full range of services to users throughout the whole process (legal, financial, protection of results, etc.);
4. encourage the communication between the research organisations and private sector, and the co-financing of projects;
5. cooperate with foreign technology agencies (especially of the EU countries) and take advantage of their experiences.

The transition period between launching the TA CR's activity and the target state is described in [6.1.1.](#)

4.1.4. Ministry of Education, Youth and Sport

As a result of the above-mentioned changes, the competencies of MoEYS will be adapted by amendment to Act No.130/2002 Coll. and MoEYS will remain responsible for:

1. the international collaboration in research and development (see [3.3.1.](#) and [6.1.2.](#)),
2. operational Programmes Research and Development for Innovation and Education for Competitiveness (see [2.2.](#)),
3. the support of large R&D infrastructures, including the National Research Programme III (see [3.3.4.](#), [5.1.](#) and [6.1.4.](#)),

4. providing institutional support to research in higher education institutions and other research organisations (see [4.2.2.](#) point 3.a) and of targeted support to specific research in higher education institutions (see [3.2.](#), point 2),
5. fulfilling administrative function of a central administration body for research and development, e.g. maintaining registers of public research organisations, and others.

4.2. Budgetary chapters of R&D

4.2.1. Number of budgetary chapters for the targeted support of R&D

1. Since 2011, the public tenders in R&D will be ensured by two agencies – GA CR for the basic research and TA CR (agency for applied research) for the applied research. The targeted funds for research and development will be directed through these two agencies, with the exception of cross-sectional and sectoral areas of R&D.
2. The international collaboration in R&D (MoEYS and MoIT for OP EI), applied security R&D (MoI), applied R&D of national and cultural identity (MoC) and support to large R&D infrastructures (MoEYS) will be ensured cross-sectionally.
3. The applied agricultural R&D (MoA), applied defence R&D (MoD) and applied healthcare R&D will be supported under respective sectors.
4. The proposed system of targeted R&D support needs 10 budgetary chapters – Office of the Government of the Czech Republic (the Council), GA CR, TA CR, cross-sectionally MoEYS, MoIT, MoI and MoC, and sectorally MoA, MoD and MoH.

4.2.2. Number of budgetary chapters for the institutional support of R&D

1. The institutional support will be linked to the accomplished results. Therefore the institutional support mechanism will be the same for everyone, the only question is under which budgetary chapter it will be granted.
2. The institutional support to private research organisations complying with the Community Framework will be granted through MoIT (industrial R&D) and MoA (agricultural R&D) so that the department fulfils its conceptual role and is able to assess the accomplished results in light of their usefulness for the industry or agriculture, respectively. Today, 10 legal entities in the industrial R&D and 9 legal entities in the agricultural R&D are supported through MoEYS.
3. The proposed system of institutional R&D support by results will need 11 budgetary chapters since 2012 (data are based on the 2007 institutional support):
 - a) MoEYS = 18 public higher education institutions for existing research plans, 2 special groups of legal entities and organisations where the present share of R&D in overall activity is low and results in applied R&D not too satisfactory. These are organisations of the Ministry of Labour and Social Affairs (2 public research institutions), Ministry of Environment (2 public research institutions and 1 state contributory organisation), Ministry of Transport (1 public research institution) and organisation of the Czech Office for Surveying, Mapping and Cadastre /hereinafter referred to as “ČÚZK”/ (1 state contributory organisation), as well as of the Ministry of Foreign Affairs (1 public research organisation) in light of the responsibility for international collaboration in R&D;
 - b) AS CR = 54 institutions of AS CR – public research organisations and expenditures on the activity of AS CR. The expenditures of AS CR Office will be specified and adapted to the proposed system;

- c) MoI = 2 organisational units of the state in view of the targeted R&D support (security research), as well as the organisation of MoJ (1 organisational unit of the state) and SÚJB (1 public research organisation and 1 organisational unit of the state) falling under this sphere;
- d) MoC = 10 state contributory organisations in view of the targeted R&D support (applied R&D of national and cultural identity);
- e) MoA = 7 institutes – public research organisations, 2 institutes – state contributory organisations and 9 non-state research organisations (the specifics of agriculture arising from the Community Framework, too);
- f) MoD = 1 organisational unit of the state and 3 state contributory organisations (the specifics of the defence research and development);
- g) MoH = 10 state contributory organisations (the specifics of the applied healthcare research given by the public health system reform);
- h) MoIT = 10 non-state research organisations;

and expenditures on the activity of three cross-sectional chapters:

- i) GA CR = expenditures on the activity of GA CR;
- j) TA CR = expenditures on the activity of TACR;
- k) Office of the Government of the Czech Republic = expenditures on the activity of the Council.

4.2.3. Overall number of budgetary chapters providing R&D support

In the new system, R&D will be supported from **11 budgetary chapters** – the chapter of the Office of Government of CR (the activity of the Research, Development & Innovation Council as a legal entity), GA CR, the newly established TA CR, MoEYS, MoIT, MoD and MoI, MoC, MoA, MoH, and AS CR.

5. Excellence in R&D

Objective (3): To support excellence in R&D, give it a preference treatment and use its results for innovation.

5.1. Centres of Excellence and large R&D infrastructure

1. The amendments to Act Nos. 111/1998 Coll. and 341/2005 Coll. will allow public higher education institutions, public research institutions and other research organisations to establish consortia meeting the conditions of the Community Framework and apply for the public R&D&I support. The conditions for participation of enterprises in these consortia will be defined by the Community Framework, as well. There will be two types of consortia:
 - a) a consortium having legal personality complying with the Community Framework conditions for a research organisation whose founder will have no preferential access to the consortium's research capacities or the consortium-generated results of research and development;
 - b) a consortium of several legal entities without legal personality, in which the founders complying with the Community Framework conditions for a research organisation stipulate in advance their mutual relationships necessary for procurement, operation and utilisation of large R&D infrastructure.
2. The replacement of the standard R&D infrastructure (instruments and equipment, etc.) will be determined by research organisations and covered from institutional expenditures allocated according to the accomplished results.
3. The procurement and operation of a large R&D infrastructure (e.g. a unique equipment, R&D libraries, joint information networks, etc.) will be supported under following conditions:

- a) from R&D expenditures only infrastructure intended exclusively for R&D or its part serving R&D will be supported;
 - b) a preferential support will be given to the joint research infrastructure utilised by consortia (of public institutions of higher education, public research institutions and other research organisations and enterprises) or jointly by research organisations and enterprises. Only if made possible by the state budget, the research infrastructure serving only to one sector will be supported (e.g. for several organisations of one department), but not the R&D infrastructure serving to only one single beneficiary;
 - c) the excellence in R&D and accomplished results will be requested, including the links to a high-quality background of respective institutions;
 - d) in selecting the infrastructure to be supported, a significant preference will be given to such infrastructure which relates to ESFRI Road-map thus guaranteeing the involvement in the international collaboration in R&D at the European or world-wide level;
 - e) the provision of links to the user's sphere will be necessary;
 - f) the obligatory utilisation of unutilised infrastructure for education of both students and research workers;
 - g) a European-wide importance of the infrastructure will be required reaching at least beyond the region's borders;
 - h) the approval procedure for large R&D infrastructure will be similar to other programmes – it will be approved by the Government upon the Council's opinion.
4. One of the important aspects to be solved is that about one half of research capacities is located in Prague that has a limited access to structural funds (e.g. under a national programme aimed at those areas, where the research and its application located in Prague are irreplaceable).
 5. Same rules like for the national support of R&D infrastructure will also apply to large and individual projects of OP RDI, especially for the Priority Axes 1 “European Centres of Excellence” and 2 “Regional Research Centres“. The state R&D expenditures will support the building and follow-up projects of the European centres of excellence and regional research centres focused on all stages of research, development and innovation, including education for which the own activity will be significantly oriented towards application bringing development to both the given region and the whole Czech Republic. This activity will be co-financed and the European centres of excellence will be more focused on creation of knowledge to be used in the long term and significant involvement in the international collaboration (and corresponding structure of financing from the state, European and private sources), while the regional research centres will be more focused on immediate collaboration with the application sphere and quicker use of knowledge.

5.2. Evaluation of R&D results at all levels

1. The evaluation of R&D and its results carried out by the Council will be simplified to serve its purpose - the distribution of institutional R&D expenditures among the budgetary chapters (see [4.2.2.](#)):
 - a) for the basic research, only world recognised results will be evaluated – publications (publications with prestigious publishing houses, publications in reviewed journals, publications originating at reputable conferences, etc.) with the exception of selected branches of humanities and social sciences focused on a nationally oriented knowledge where the excellence will be measured within the National Reference Framework;
 - b) in the applied R&D only results utilisable in innovation will be evaluated (patents, realized technologies, software, results projected into legal regulations, standards, directives, and non-

legislative regulations binding within the competence of each respective provider, and certified methodology, etc.).

2. The evaluation at other levels, i.e. the evaluation of projects, evaluation of programmes, evaluation of research plans, evaluation of organisations by their founder (see [3.2.](#), point 1.a), evaluation of fulfilment of R&D concepts (R&D policies and departmental policies) will be:
 - a) obligatorily published once a year (if no other term is determined by the Government);
 - b) made by the Council in preparation of the draft versions of R&D expenditures in terms of progress in removal of drawbacks; consequences will be drawn from non-fulfilment.
3. The concept of the Information System for research, development and innovation will define the scope in which the information support for evaluation of programme results (or for evaluation of results at the level of individual providers) will be provided to all the chapters.

6. R&D Programmes

Objective (4): To condition the programme support of R&D upon cooperation of public research with users of R&D results based on co-financing from public and private sources.

6.1. Introducing a new system of applied R&D programmes

6.1.1. Programmes supported from TA CR budgetary chapter

TACR (see [4.1.3.](#)) will start its operations in 2010 (the amendment to Act No.130/2002 Coll., under which it will be established will take effect in. 2009) and it will commence its activities progressively:

1. The target state – preparation and approval of R&D programmes
 - a) Programmes of applied R&D as a follow-up to R&D concepts in a given sector will be prepared by a competent department.
 - b) New programmes of applied research and development will be supported only in case that their co-financing from public and private sources is provided, with the exception of programmes where the state or region will be the only user of their results.
 - c) The law will specify more precisely the basic attributes of programmes – clear and measurable/evaluable target, criteria for its fulfilment, way of its attainment and way of evaluating the accomplished results and their use.
 - d) Unlike the present state, there will be no departmentally-unique tender documentation, for which only the department – provider is responsible now and there will be no departmentally-unique system of receiving, assessing and evaluating draft projects, etc. The competent department will have available a single system of TA CR and will have to include in the draft version of the programme all necessary specifics.
 - e) The Council and TA CR will be required to comment on the draft version of the programme prior to its discussion in the Government.
2. The target state – realization of programmes
 - a) After being approved by the Government, the Council will include the funds for the programme solution in the TA CR budget.
 - b) A public tender in R&D will be realized by TA CR that will be responsible for controlling the solution of individual projects and accomplishment of results.
 - c) TA CR will inform the Council and the programme submitter (a competent department) on the process of the programme's solution. At least once (with five years and shorter-term programmes) or twice (with longer-term programmes) during the period of the programme's

solution TA CR will evaluate how programme targets are fulfilled and what results are attained, with the department or the Council proposing necessary changes to the programme.

- d) After termination of the programme, TA CR will evaluate the fulfilment of its targets and achieved results. Unlike today, only such results will be admitted that are approved as results of the programme's solution by the competent programme's council at TA CR.
- e) Collectively terminated programmes will be evaluated and the Council will submit this evaluation to the Government.

3. The transition period

To change the system of support granted to R&D programmes will require a period of transition. The existing departmental R&D programmes and programmes being under preparation in the field realized by TA CR have various time schemes; there are four main types of situations:

- a) The programme is already being solved, as well as all its projects - they will be completed under the competence of existing providers.
- b) The programme is already being solved, as well as part of its projects, but not all of them (new rounds of public tenders in R&D are planned) – where the programme is in compliance with the Community Framework, public tenders will be arranged by TA CR after it commences its activity. The projects being already solved will be completed under the competence of existing providers.
- c) The programme is only under preparation to be commenced in 2010 (TA CR won't exist at that time and so the public tenders in 2009 must be arranged by existing providers (again on condition of their compliance with the Community Framework)).
- d) The programme is proposed to commence in 2011 – the programme will be rewritten according to the new National Research, Development and Innovation policy of the Czech Republic for 2009 - 2015 and so the public tender in R&D will be arranged by TACR.

6.1.2. Cross-sectional programmes of international collaboration (MoEYS)

For programmes of international collaboration in R&D, the present single model of international collaboration programmes arising from the Czech Republic's commitments, negotiated and ratified at competent levels will be divided by law to individual forms so that the funds spent on collaboration yield at least same results as with the national programmes:

- 1. The programmes where evaluation and selection of projects may proceed at both international and national levels and the organisation gets funds for the project solution from foreign or state R&D expenditures - when statutory conditions are met (Act No.171/2007 Coll.), the entitlement to state subsidy for research and development will be maintained on the basis of a request without any further selection. In other cases the financing will be targeted according to the anticipated results.
- 2. The programmes where the Czech Republic (as a rule, through its organisations) participates in joint preparation and subsequent utilisation of an international workplace (a typical example is CERN, etc.). The participation fee will be covered institutionally, while the programmes financing will be targeted according to the anticipated results.
- 3. The programmes and projects of a multilateral international collaboration, to which the Czech Republic has committed itself after being approved at a competent level, and this commitment will generate an obligation to cover an international fee, if any, and realize the project or projects in question from the state funds (typical examples are OECD or IEA projects focused on research in education and competencies such as PISA, PIAAC, TIMSS, VET, EUROSTUDENT projects and others).

4. Bilateral collaborations under intergovernmental bilateral agreements not focused primarily on attainment of classic R&D results – specific targets will be set and accordingly the amount of support.

6.1.3. Cross-sectional programmes of MoI and MoC

1. The programmes will fall under the competence of a responsible department (MoI or MoC) and will be realized by it, but there will be also a participation from other departments, experts from different types of institutions, etc. All the more demanding will be then the Council when assessing their draft versions and monitoring their progress.
2. There will be at most two programmes in each area – one to be realized as a set of public contracts and second through a public tender in R&D.
3. Subsequent to the interdepartmental concepts being approved by the Government in 2008, the cross-sectional programmes will commence in 2010 (MoI) and 2011 (MoC) respectively; the programmes and projects being already solved will be completed under the competence of the existing providers (for the transitional period the model is analogous to TA CR– see [6.1.1.](#), point 3.).

6.1.4. Programmes of support to large R&D infrastructures

1. The National Research Programme III (MoEYS) is intended to finance part of the expenditures on projects following up with OP RDI and OP EC. In all other aspects it will have to comply with the conditions of programmes of applied R&D, starting from the co-financing and ending with results comparable to other programmes. The effectiveness of state budget expenditures spent within the programme (and therefore also within each project) will be evaluated as a whole, i.e. including state spending on investment (covered by co-financing of OP RDI and OP EC).
2. Other large R&D infrastructures supported from both national and foreign resources (e.g. ESFRI) will be supported under the same conditions as large R&D infrastructures supported from the EU Structural Funds.
3. Large R&D infrastructures financed from national R&D funds will be supported under long-term specific programmes approved by the Government that will ensure their long-term support under following conditions:
 - a) their building and/or operation will comply with the National Research, Development & Innovation Policy of the Czech Republic;
 - b) they will meet the conditions under [5.1.](#)

6.1.5. Sectoral programmes of MoA, MoD and MoH

The preparation and approval of programmes, their continuous control, etc. will be the same as in other programmes.

6.1.6. Specific R&D programmes

Those departments that will provide targeted funds to the programmes of applied R&D (TA CR, MoEYS, MoI, MoC, MoA, MoD and MoH) will have the possibility (or obligation respectively in case of a task of the National Research, Development and Innovation Policy of the Czech Republic) to propose specific programmes aimed at specific R&D fields (e.g. the support of the transfer of R&D results, their popularization, etc.). The anticipated results and the way of their evaluation will correspond to the targets. This type of programmes will only complement the basic programme support of R&D&I.

6.1.7. Regional R&D programmes

Act No.130/2002 Coll. will change the approval process for draft versions of R&D programmes of individual regions. Until the 'Council's opinion' stage the process will be the same as with other

programmes, but the programme cannot be approved by the Government, but the region, and the region itself will aid the programme from its funds. These programmes will have to be based on the Region-approved strategies of regional development.

6.2. Principles applicable to all R&D programmes

The principles stated below will apply to the acceptance, realization and result evaluation of all programmes:

1. To evaluate the programmes of research and development against pre-set clearly defined targets, including the utilisation of accomplished results.
2. To ensure co-financing of programmes of applied research and development from public-private funds (with the exception of those where the state or region will be the only user of results) and prefer those projects, in the solution of which an entrepreneurial entity and research organisation will participate.
3. To evaluate the draft versions of programme projects of research and development against the programme's target; significantly limited will be the importance of the professional history assessment (never of an individual and only partly of the team) in the programme projects and significantly higher will be the importance of evaluating the newness, originality and benefit to the programme's targets.
4. To request the proper way of project support of research and development, especially the observance of principles mentioned in parts 1.1 and 2.1 of the material approved by the Government resolution No. 644 of 23 June 2004.
5. To support teams, not individuals or entire institutions.

6.3. Indirect (tax) support of R&D&I

The Resolution of the Government of the Czech Republic No. 531/2007 imposed on the Minister of Finance to work up and submit to the Government the new income tax bill by 31 December 2008. At present, the substantial intent of the new income tax act is prepared and contains the aim to encourage the realization of research and development projects through deductions reducing the income tax base (like it is since 2005) in combination with a multiple increase in the costs of research and development against the set time moment and then in comparison with the previous taxation period so that the increase in the private research and development expenditures is encouraged in compliance with the Lisbon Strategy. Also the research purchased from higher education institutions and research organisations will be encouraged.

7. Research organisations

Objective (5): To introduce more flexible organisational structures of public research.

7.1. Measures resulting from the change in the R&D support system

The main changes contributing to higher flexibility of the organisational structure of the Czech research and development are as follows:

1. the institutional support changes into allocation of funds according to the accomplished results (see [3.2.](#));
2. the support of excellence by investing into large R&D infrastructures used jointly by entities from various sectors (see [5.1.](#));
3. the establishment of TA CR (see [4.1.3.](#)) and joint rules for programmes of applied R&D (see [6.2.](#));
4. the use of EU Structural Funds 2007–2013 (OP EI, OP RDI) for strengthening the applied research, development and innovation in regions of the Czech Republic (see [2.2.](#) and [6.1.7.](#));
5. the obligation of research organisations to establish a functional system for the intellectual property rights protection, and transfer and commercialization of results for the applied R&D (see [2.3.](#), point 5).

7.2. Additional measures to set into motion the rigid organisational structure of public research

The act on tertiary education that is under preparation should ensure especially the change in:

1. the way the funds for education in institutions of higher education are allocated – significantly strengthen the financing according to the number and quality of education and R&D of individual higher education institutions, or faculties, with taking into account the costs;
2. the system of management of higher education institutions so that their bodies responsible for development and results have adequate competencies and instruments available (the same partly applies also for the public research institutions);
3. the possibility to engage in education also the best experts from practice and from abroad on the basis of a selection procedure.

8. Workers in R&D&I

Objective (6): To provide experts for research, development and innovation.

8.1. Operational programme Education for Competitiveness

The “Education for Competitiveness” Operational Programme will encourage the education of experts in research, development and innovation.

8.2. Additional measures to provide experts for research, development and innovation

1. That part of research that is immediately connected with education and in which the students participate, will obtain targeted support (individual projects).
2. The programmes of applied R&D assuming the increase in the number of research workers will include an obligatory share of young workers aged below 35 years and middle generation workers having international experiences as a precondition.
3. The career rules will be compulsory in all research organisations.
4. The hiring of research workers from the third countries (outside EU) will be simplified.

9. International collaboration in R&D

Objective (7): To engage the Czech Republic intensively in the EU research and development and other international collaboration.

9.1. Measures resulting from the change in the R&D support system

The main measures resulting from the change in the R&D support system intensively engaging the Czech Republic in R&D in EU and other international collaboration are as follows:

1. **The change in the R&D support system in relation to international collaboration** is referred to in [3.3.1.](#)
2. **The state administration in international R&D collaboration** is dealt with in [4.2.1.](#)
3. **Programmes in international R&D collaboration** and their system are referred to in [6.1.2.](#)

9.2. The use of European resources as public expenditures on research and development for innovation

1. The effective use of European money on research and development for innovation is the priority of the state budget R&D expenditures.
2. Likewise other countries, the Czech Republic will determine what will be covered from national resources (what it will manage itself), what will be financed from EU (whether in collaboration with other countries or under the conditions of EC) and what it won't do at all. These three options must be balanced and mutually linked in terms of the size of the Czech Republic and its available resources.

3. The existing R&D priorities (MLDR) will be reviewed mainly from this point of view to ensure the effective use of national and European R&D resources for attaining economic and other benefits.

9.3. Definition of OP RDI in light of the Reform

The Reform concerns OP RDI particularly in following parts:

1. **Mutual relations between OP RDI, OP EI and OP EC** – see [2.2.](#)
2. **Co-financing of OP RDI projects** - see [3.3.1.](#), point 3
3. **Centres of Excellence and large R&D infrastructure** – see [5.1.](#)
4. **Projects following up with OP RDI** (“sustainability of OP RDI“) – see [6.1.4.](#), point 1.

9.4. Additional measures for involvement of the Czech Republic in R&D&I within the EU and other international collaboration

1. The concept of international collaboration of the Czech Republic in R&D&I will include also the issue of financing the proposed activities.
2. A system will be introduced allowing to have access to and coordinate the views and positions presented by the Czech representatives in order:
 - a) to have available present views and positions of the Czech Republic on the given issue;
 - b) to come forward with a position (view) that was discussed and approved by all relevant bodies;
 - c) to provide relevant information on the results of negotiations.
3. In case of any new possibility for international collaboration it will be carefully analysed and weighted, if such collaboration is advantageous and beneficial for the Czech Republic.

EXPLANATORY REPORT TO THE REFORM

Ad 1. Starting points for the Reform

The Czech Republic may succeed in a world of globalised competition only with a well-functioning triangle of “education, research and innovation“ as other flourishing countries. Each of these three areas, three groups of activities, must be well-structured in itself. They must be co-participated by both public and private sector, the mutual relations of these three areas must be free of formalities and barriers restricting the effectiveness of the system as a whole, and synergies must be encouraged between all of them. Basic research must be understood as a necessary foreground for the subsequent applied research, development and innovation. Furthermore, basic research with its top results improves the reputation of the Czech Republic in itself, increases the interest of both domestic and foreign research workers to participate in it and attracts foreign investors in high technologies. Even basic research may certainly become part of the projects of applied research and development, but projects of applied research and development cannot end up with the results of basic research (publications, etc.).

The Reform will enhance the reputation and attractiveness of the Czech Republic for home and foreign research workers, the interest of foreign countries in research cooperation with the Czech teams and organisations, interest in the purchase of research, licences or know-how in Czech organisations. In addition, it will establish conditions encouraging the research organisations supported from public funds to transfer R&D knowledge into practice, conditions for commercialization of results and intellectual property rights protection and force the research organisations to use them when handling the R&D results. In this text the research organisations are in compliance with the definitions (see Annex V.1.) not only research institutions, but also institutions of higher education, and others. The Reform must contribute to the growing success of the Czech enterprises on international markets with top quality products, technologies and services based on readily applied results of Czech research.

Ad 1.2. Objectives of the Reform

The Reform aims to achieve seven main objectives implicating an improvement of the present state. All objectives are described and substantiated in the following chapters using the SWOT¹ analysis based on four analyses approved by the Government in 2007:

1. by the Government Resolution No. 539 of 23 May 2007 on the Summary evaluation of results of research and development programmes completed in 2005, with simultaneous evaluation of the fulfilment of the Government Resolution No. 644 of 23 June 2004 on the Evaluation of research and development and its results and the system of public R&D expenditures management in respective departments.
2. by the Government Resolution No. 1213 of 29 October 2007 on the Recapitulation report on the fulfilment of measures adopted on the basis of previous analyses of research and development summing up the evaluation of fulfilment of tasks imposed upon the research and development system by previous governments.
3. by the Government Resolution No. 1284 of 14 November 2007 on the Analysis of the existing state of research, development and innovation in the Czech Republic and a comparison with the situation abroad in 2007, where the situation in the Czech Republic is compared by international criteria to that of the developed countries in terms of research, development, innovation and competitiveness.
4. by the Government Resolution No. 1305 of 21 November 2007 on the Evaluation of fulfilment of the National Innovation Policy of the Czech Republic for 2005-2010 in 2007, where the non-fulfilment or delay in many tasks related to the system of support was stated.

¹ SWOT: Strengths, Weaknesses, Opportunities and Threats.

Annex V.7. mentions the Green Book on Research, Development and Innovation in the Czech Republic that will be finished into the White Book on Research, Development and Innovation in the Czech Republic in the course of 2008 as a standard document of EU countries for this field.

Ad 1.3. Reasons for the Reform

The importance and weight of individual reasons differ across departments, sectors, etc (especially in the face of a considerably different state of the R&D support), but in complex and for the Czech Republic as a whole they present a clear argument for the necessity to make an essential change in the whole system of research, development and innovation.

- Ad 1: So far very low benefits of research, development and innovation to the economy and society of the Czech Republic are documented by following facts. From the institutional 2007 expenditures on research plans in the amount of CZK 8.9 bn/year, 51% is intended for the applied R&D (ca **CZK 4.5 bn/year**); the results of the applied R&D are minimal. From the targeted expenditures of CZK 9.5 bn/year, 77% is intended for the applied R&D (CZK 7.3 bn/year); for ca **CZK 4.8 bn/year** of non-industrial applied R&D the results are minimal, too. The whole Reform focuses on the rational use of these funds. The aim is that the funds for applied R&D in the amount of **CZK 9.3 bn/year** (2007 data), i.e. **43 per cent** of the state R&D expenditures are really spent on a first-class applied R&D with results used in innovations and the application sphere (and not basic research, often without any world-wide comparable results). Details are given in Annex V.2.
- Ad 2: The existing system of R&D support is failing also at the national level – e.g. from seven R&D programmes which should start in 2009 and for which the funds have been planned for two years now in the medium-term outlook for R&D expenditures, only three will commence (MoIT – TIP, MoA – VAK and INFOZ – MoEYS, with a slight delay). For the remaining four programmes, their providers have not been able to submit the draft programmes within a deadline for the Government to be able to approve it before starting the preparation of a draft R&D Budget for 2009. Because of the necessary notification of the Government-approved R&D programmes by the European Commission, it seems probable that the solution of these four programmes will not start in 2009. The problems with the delay of OP RDI that should have commenced in 2007 (and therefore the two years shift of the follow-up NRP III programme) illustrate the delay in the utilisation of EU funds.
- Ad 3: The growing backwardness concerns not only disciplines of social sciences, in which the Czech Republic brings practically nothing new to the world knowledge, but also several disciplines of natural and technical sciences generally considered successful in the Czech Republic. In response to the articles published in WoS (RCIO - Relative citation impact of a discipline for 2001–2005), the Czech Republic still lags behind the world in some disciplines. This indicator cannot be seen as absolute facts, but it definitely does not testify for the often-declared world level of the discipline for the whole Czech Republic, even if some teams or individuals undoubtedly reach this high standard. On the other hand, the year-on-year development of RCIO show that in many disciplines of basic research, especially in technical and medical sciences, the citation index of Czech works is growing. Another example of this backwardness are results of the first grants awarded by the European Research Council to the scientists that are 2 to 9 years after taking their PhD degree. In this category the Czech Republic has won only one grant and was last but one among 21 competing countries.

Ad 1.4. Principles of the Reform

The proposed principles logically follow from the above reasons for the Reform (see [Ad 1.3.](#)) in order to remove the drawbacks in the existing system.

Ad 2. Interconnection of research, development and innovation

The principal drawback of the present system of R&D support is the absolutely insufficient utilisation of the results in applied research, development and innovation. The reasons are many – starting from the unsuccessful search for “our own way” in the applied research, development and innovation (the Czech Republic is the only advanced country, where the whole industrial research was privatised and then practically all dissolved), the application of a grant system to the applied research and development and unilaterally focused “scientific” policies (the National Innovation Policy was adopted only in 2005) and ending with departmental programmes of applied research and development that were mostly too general and focused primarily on basic research (for many of them this situation has survived until the present days). The result is that the contribution of the Czech Republic to the world knowledge grows slowly but surely, but this knowledge is realized away from it and the benefits from new products, technologies and services are received by other countries, with exceptions.

SWOT

Strengths: In the international comparison of the innovation performance (European Innovation Scoreboard 2006), the Czech Republic has moved into the group of countries, which lag behind the EU average, but their growth is higher than the EU average. The share of innovations in enterprises is growing and the foreign companies are establishing their research and development workplaces here. In 2005, the Czech Republic adopted its National Innovation Policy (as the last country in EU), of which more than half of the measures are fulfilled or are being fulfilled. There is a growing agreement among the representatives from the entrepreneurial sphere, R&D and public administration that the aforesaid previous changes will have to be completed with an effective public support to innovation.

Weaknesses: Any permitted (market-compatible) public support to innovation is missing, being substituted partially and yet insufficiently by the commencing support from the EU Structural Funds. The legislative definition of permitted public support of innovation is missing; only partially the support of certain entities (small and medium-sized enterprises) is regulated. The responsibility of state administration for innovation is missing. Any publicly accessible information on public (mainly state) funds spent on innovation is missing. Links to research and development are insufficient; the tasks of the National Innovation Policy in this regard remained largely unfulfilled or were postponed respectively; the missing strategy is substituted by ad hoc documents such as “System mechanisms for generating synergic effects between the operational programmes “Research and Development for Innovation” and “Enterprise and Innovation”). There is a lack of confidence in the state administration, research organisations and many enterprises in R&D being the means to enhance the economic performance of the country.

Opportunities: To use this unique availability of the Structural Funds 2007 - 2013 to make a prompt change in the system of the Czech research and development, its support from own resources and its cohesion with innovation and realize this system of research and development so that it would result in economic and other benefits to the Czech Republic. At the same time, this period is an opportunity to prepare for the next one when the inflow of funds from EU in this scope will stop.

Threats: The preservation of existing approach separating the research and development from innovation that would lead to a non-application of results in practice, gradual reduction in the amount of R&D expenditures and growing backwardness of the Czech Republic. Justified worries arise that in the conditions when China, India, Brazil and other dynamically developing countries fiercely enter the markets with top products and technologies the so far natural trend of the Czech Republic in approaching the EU-27 average in competitiveness will slow or even stop.

Ad 2.1. Establishing legal conditions for support of innovation

Ad 1. Definitions are referred to in Annex V.1. Ordinary or regular changes in products, production lines, production processes, existing services and other unfinished operations are not qualified for the state support even if they can represent an improvement.

Ad 2. To the conditions of support:

- a) organisational innovation must always relate to the use and utilisation of information and communication technologies (ICT) and lead to change in the organisation;
- b) innovation is formulated as a project with defined and qualified project manager and defined project costs;
- c) the result of a supported project is the development of a standard, business model, methodology or concept, which can be systematically reproduced or certified and patented;
- d) process innovation or organisational innovation are new or significantly improved in comparison with the existing state of the art in the given sector in the Community. Newness can be proved, for example, through precise description of the innovation in comparison with the present process or organisational techniques used by other enterprises in the same sector;
- e) any project in process innovation or organisational innovation includes a considerable portion of risk. This risk can be proved, for example, by providing convincing documentation of the project costs in proportion to the company's turnover, the time necessary for development of a new process, expected revenues from process innovation in comparison with the project costs and probability of failure.

If innovations result from R&D (i.e. part of the research, development and innovation programmes), they will be supported within the R&D expenditures framework. If support of innovation, which is not the result of R&D, is to be realized in the future (the Community Framework allows such support), then it is necessary to resolve, along with the introduction of the support, from what funds it will be supported.

Ad 3. To the permitted amount of support:

The support of process innovation and organisational innovation in services is compatible with the common market within the meaning of Article 87 (3) (c) of EC Treaty at maximum amount of support of 15 per cent in case of large enterprises, 25 per cent in case of medium-sized enterprises and 35 per cent in case of small enterprises. Large enterprises are qualified for this support only if they cooperate with small and medium-sized enterprises, the activity is supported and the cooperating small and medium-sized enterprises incur no less than 30 per cent of the overall eligible costs. The permitted amount of support in the implementing regulation will be given as a reference to EU regulations in order to reduce the necessity of their amendment in case of any changes in the amounts of support.

Ad 4. To the ownership of results and right of their use:

In many cases, the R&D results in the Czech Republic are not protected at all; in the applied research and development often contracts are not concluded contrary to law on the use of results. At the same time, with some scarce exceptions, the arrangement of relations between the author of the result (researcher) and the institution motivating both parties to use the results is missing. This, along with the absence of the intellectual property rights protection and their commercialization (see [2.3.](#), point 5) means that most of R&D results is either not utilised or brings no effect to the Czech Republic.

Ad 2.2. Operational programmes Research and Development for Innovation, Enterprise and Innovation, Education for Competitiveness, Prague – Competitiveness, and Prague – Adaptability

The Operational Programme “Research and Development for Innovation” is largely focused on the area of support of research and development for innovation. For the period 2007 – 2013, this sphere will be supported from public budgets by the amount of ca CZK 68 bn (85 per cent from EU and 15 per cent are expenditures of the state budget on research and development). Focus of the support is illustrated in Annex V.3.1.

The field of research, development and innovation in the Operational Programme Enterprise and Innovation will be supported in 2007 - 2013 from public budgets in the overall amount of ca CZK 24 bn (85 per cent from EU and 15 per cent are expenditures of the state budget on research and development). Focus of the support is illustrated in Annex V.3.2.

The field of research, development and innovation in the Operational Programme “Education for Competitiveness” will be supported in 2007 - 2013 from public budgets in the overall amount of ca CZK 7 bn (85 per cent from EU and 15 per cent are expenditures of the state budget on research and development). Focus of the support is illustrated in Annex V.3.3.

Ad 2.3. Preparation for the period after 2015

Ad 1: Unlike the basic research and development (with the dominant position of the intradepartmental Grant Agency of the Czech Republic), the present system hinders competition of research organisations of different departments without ensuring the attainment of results of applied research and development (more than 99 per cent of the reported results of applied research and development programmes are results typical of basic research, without bringing any essential benefit to the world knowledge). There occurs a situation that funds are allocated by law to applied research and development (ca 60 per cent of the state support given to research and development), but they are often spent on basic, mostly not high quality research. Therefore, paradoxically, the Czech Republic has the highest share in the world of basic research in the state budget spending on research and development in the EU statistics – 66 per cent; EU-27 average is 31 per cent!²). And where it is really the support of applied research and development with co-financing by users (MoIT programmes), the link-up to innovation is missing – it is not known how many results have been really realized in new products, technologies and services in the Czech Republic and what was the economic benefit (after all, it is not known either how much the state spends on innovation support, known is only the overall amount of support together with enterprise, which exceeds CZK 100 bn annually).

Ad 2: The National Research and Development Policy of the Czech Republic for 2004 až 2008 /hereinafter referred to as “NR&DP”/ was approved upon the proposal of MoEYS by the Government Resolution No. 5 of 7 January 2004. The first essential update came after one year of its existence (because it has ignored the admission of the Czech Republic into EU in May 2004) by the Government Resolution No. 43 of 12 January 2005 on the Priority measures in the accession of the Czech Republic to the material “Investing in research: Action plan for Europe” COM (2003) 226. In addition, NR&DP contained no links of research and development to innovation and therefore the Research and Development Council have developed the National Innovation Policy of the Czech Republic for 2005 – 2010 approved by the Government Resolution No. 851 of 7 July 2005. Then NR&DR was essentially updated again by the Government Resolution No. 178 of 22 February 2006 on Harmonisation of the National Research and Development Policy of the Czech Republic for 2004 - 2008 with the National Innovation Policy and other relevant documents of the

² Eurostat “R&D activities and costs”, Statistics in Focus, 120/2007.

Czech Republic and the European Union. NR&DP thus has become a non-conceptual material describing the already made changes, not a “document approved by the Government, containing the lay-out of basic targets of support of research and development from public and other funds, their classification, substantial intent of support in the period of 4 to 6 years and measures for their realization “ under Section 5 (1)(a) of Act No. 130/2002 Coll.

The present Reform of the system of research, development and innovation thus substitutes the National Research and Development Policy as the first necessary step introducing the necessary changes in this area in 2008 and at the beginning of 2009. At the same time, however, the Czech Republic must have (yet in view of EU Treaty wording) a standard policy for the whole area of research, development and innovation for the years 2009 to 2015 that will be submitted to the Government in March 2009.

- Ad 3: This is an unfulfilled task from the National Innovation Policy of the Czech Republic for 2005 – 2010 approved by the Government Resolution No.851 of 7 July 2005. Besides the above mentioned, the reason is that no body has been yet made competently responsible for the sphere of innovation in the Czech Republic.
- Ad 4: Likewise in research and development, also the expenditures on innovation supported by the state and its results will be open to public. At present these expenditures are not known at all.
- Ad 5: The absence of the system of intellectual property rights protection, transfer and commercialization of results in research organisations is one of the reasons of very low results of applied research and development. Resources intended for introduction of such system are contained in the Operational Programme Research and Development for Innovation (Priority Axis 3).
- Ad 6: Especially in the innovation sphere it is necessary to finalise the legal aspect of the protection of the intellectual property results (including relations to R&D results) in order to encourage both institutions and individuals to use them in new products, technologies and services.
- Ad 7: Even if the reform of tertiary education is a formally independent document prepared by MoEYS, there are many relations between it and research, development and innovation, and therefore the submitted material deals, particularly in part [7.2](#) , also with this issue where it will immediately influence the research, development and innovation.

Ad 3. The R&D support system

The existing system of the state (public) support of research and development was conceived at the beginning of the nineties (Act No.300/1992 Coll.) and was partially modified after 2000 (by Act No.130/2002 Coll.). Although in its time it enabled the development of R&D, at present it has outlived its usefulness and has been decelerating any further development in the past few year. In many cases this system has been failing and without a fundamental change it will not be able to use effectively the EU funds in 2007 – 2013 (the increase from ca CZK 25 bn to CZK 40 bn).

SWOT

Strengths: In a long term, the Czech Republic has introduced basic standard instruments for R&D support from public funds – the grant system, the programme support and the institutional support. These instruments basically correspond to EU legislation.

Weaknesses: The system of support is very complicated, with high administrative demands on all participants (both departments and researchers), the individual ways of its providing are more and more getting closer to each other and the differences are formal and legal, not factual (e.g. between the projects and research plans). Efforts to reduce the paperwork burden in research and development, e.g. the Government Resolution No.1260 of 29 September 2005 on the proposal to consolidate the administration

of research and development, have failed partly for the inability of departments to agree on joint action, and partly and (especially) because it is not possible to reduce considerably the administration without changing the whole system. The system of the state (public) support of research and development stagnates, its drawbacks are repeatedly ignored. Among them there is particularly the enormous fragmentation of the support both at the level of budgetary chapters and projects. Too many research workers get funds from the research plans, from ca 5 500 annually solved grants and from projects of hundred national research programmes at the same time (thus one R&D project falls on about two research workers in the public sector). The accompanying effects are increased paperwork in preparing and evaluating proposals, less time spent by own research work and conceptual work at individual departments, and numerous duplicities. The system is failing at present, the amount of not drawn funds for R&D is rising, as well as delays in funds releasing (for the current year's projects not earlier than in December, etc.).

The drawbacks of the grant system (that works best, relatively) are minimal differences in the evaluation of grant projects (leading to a subjective selection), ethical problems (high success rate of workplaces of the selection committee's members), etc. claimed already in 2004 (see the Report of GA CR Control Council, the problem was mentioned already in the Government Resolution No. 644 of 23 June 2004 on the Evaluation of research and development and its results).

Even more significant problems occur in programmes of applied research and development – the annual evaluation of completed programmes shows that in many cases the results don't correspond to the declared targets and that large amounts were spent ineffectively (see the Government Resolution No. 539 of 23 May 2007 on the Summary evaluation of results of research and development programmes completed in 2005; it can be expected that evaluation of programmes completed in 2006 will end up with similar results). The summary evaluation of programmes at the Government's level, which is prepared by the Council, has been repeatedly discovering the principal mistakes each year (neither the number of solved projects, nor money spent on them are in agreement, programmes and projects with no results are marked as excellent or at the world's top level, reported are also results that were published prior to the programme or project's commencement, etc.). Fundamental drawback is the fact that in many cases it is a freely connected set of projects in basic research (with results unable to bear comparison with the world) and not programmes of applied research and development. Individual departments (with rare exceptions such as MoIT) thus support, through absolutely unsuitable form and without adequate results, often poor basic research, which is absolutely outside of their competencies. The existing system neither solves the issue of large and expensive infrastructure, its procurement and operation.

Significant problems occur also in the institutional support where the research plans particularly in applied non-industrial research and development don't serve the set objective (a long-term conceptual development of a given institution); in many cases there is a similarity with projects offered without any public tender, the only difference is that there is no effective feedback between the results being accomplished in the course of seven year and the provided funds. From the point of view of research organisation, the institutional support is questionable, too. They must finance from it a whole range of research activities having nothing in common with the wording of the research plan (e.g. international collaboration, etc.).

The present way of support to specific research in higher education institutions allocated according to many different indicators has only very loose links to what it should serve for – the support of research connected with education in the research work of students within the framework of their Masters' and Doctors' theses, etc. The existing criteria and amounts of support for the specific research in higher education institutions are illustrated on Annex V.6. The result is that part of the funds intended to support the specific research here is spent on research in the given institution in general, that in better case, and on activities not related to the research at all, in the worse case. The effectiveness (measured by the number of graduates) of education in the Doctor's study programs is a relatively low, even at a relatively

high number of doctorands in the Czech Republic (ca 24 000). One of the reasons for this situation are low scholarships reducing the motivation of young people to get involved in the scientific work.

For all methods of support it applies that there are considerable differences in the demands and objectivity between the evaluations of draft grant projects, programme projects, research plans, and research programmes (this ex ante evaluation is very complex and detailed) and the final evaluation. The final evaluation has only a formal character (“tasks are fulfilled and researchers awarded”) and practically takes not account of the accomplished results of projects or programmes. After Cuba (100 %), the Czech Republic is the second best country in successfulness of projects (99.2 %), other countries are lagging badly “behind” (75 % and less). This pretty much speaks about the quality of final evaluation of projects in the Czech Republic.

The system dating back to the nineties is not adapted to the Czech Republic’s membership in EU. Besides many other negative consequences, it is the cause of limited possibilities to access the EU funds and be involved in the international collaboration in research and development. The whole system of state support of research and development is built upon a specific knowledge of several employees of the state administration and it is failing or even has already collapsed in some departments due to the staff alterations and reduction in their numbers. Everything is complicated further by low attractiveness of the professional career in the state administration for the above-average higher education graduates.

Opportunities: To use the Reform for making a fundamental change in the system of support of research and development, to simplify it and get under public control on one side and get involved in the international collaboration in research and development and utilise the EU funds on the other.

Threats: Gradual, already observable failure of the whole system of R&D support, which cannot be maintained in the future with the ever decreasing number of employees of respective departments, leaving alone any further development.

Ad 3.1. Targeted R&D support

Ad 3.1.1. Public tenders in R&D

Ad 1: It applies to the prevalent part of applied research and development that while public tenders in R&D satisfy formal requirements, they do not satisfy the purpose of public tenders – to ensure competition and select the best projects. Since the targeted support is granted through 20 budgetary chapters and dozens of programmes, the funds in most of them are spent predominantly by institutions of a given department. Therefore, there is practically no direct competition between research organisations in applied research and development that has proved right in basic research. This is one of the principal arguments in support of establishment of the Technology Agency of the Czech Republic that significantly contributes to competitiveness and economic and social growth in many countries.

Ad 2: The major part of the state administration workers dealing with research and development solves operative issues connected with public tenders; the conceptual work at departments is basically non-existent. The establishment of the Technology Agency of the Czech Republic will enable departments to detach part of their workers to what is their main task and what they do in the advanced countries – the concept of the sector’s development in terms of research and development and consequential programmes of research and development. At present, they practically do not perform this work – e.g. the inspection conducted in the second quarter of 2007 found out that neither of the large providers has submitted or worked up an update of its R&D policy or concept as was imposed on them by the Government Resolution No. 851 of 7 July 2005.

Ad 3: Besides the above mentioned advantages – mutual competition of research organisations, links to innovation and conceptual work of departments (points 1 and 2), another advantage is the substantial reduction of paperwork in research and development. Today, every department has

a unique system and with regard to the decentralisation, every organisation or research worker respectively has to learn 4 – 7 systems depending on the sector, in which they are active. In view of spending of the state funds on research and development, the establishment of the Technology Agency of the Czech Republic will lead to a substantially higher objectivity than ever. Now, the department is the author of the programme and at the same time it is responsible for its fulfilment, which leads to softening of programme targets already in the time of their preparation and unfair and unobjective evaluation of their results (see, for example, the Summary evaluation of results of research and development programmes completed in 2005 approved by the Government Resolution No. 539 of 23 May 2007). The reform does not change the obligations of providers stipulated by legal regulations issued by EC (especially the notification duty), these are obligations, by which the Czech Republic is bound as a member of EU. Now, EC is preparing the block exception related also to research and development.

Ad 3.1.2. Public contracts in R&D

Ad 1: For 2008, there are public R&D contracts in the amount of CZK 7.0 mil (the Office of the Government of CR – for the Council's activity) and public contracts realized for the use of institutional funds of GA CR and AS CR (for the activity of the two bodies).

Ad 2: For 2008, there are public R&D contracts in the overall amount of CZK 279.5 mil. (defence R&D of MoD – CZK 193.3 mil, security R&D of MoI – CZK 37.2 mil, ČBÚ – CZK 26.1 mil, MoJ – CZK 6.0 mil and BIS – CZK 9.6 mil, international collaboration in R&D of MoFA – CZK 7.3 mil). In preparation of new public contracts, the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Pre-commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe (COM /2007/ 799 final of 14 December 2007) will be applied.

Ad 3: For example, public contracts in SÚJB programme "Research and development for the needs of SÚJB as the regulatory authority in the area of nuclear safety, radiation protection and verification of handling with chemical and biological weapons" – CZK 26.5 mil.

Ad 4: For 2008, part of public R&D contracts in the overall amount of CZK 16.8 mil (MfRD – CZK 6.5 mil, MoEYS – CZK 5.0 mil and MoLSA – CZK 5.3 mil) with their volume significantly decreasing in the past years due to the Council's efforts. In case of standard outputs of applied R&D they will be realized by TA CR.

Ad 3.2. Institutional R&D support

Ad 1: The allocation of institutional funds among the budgetary chapters cannot stem only from the amount of funds that were allocated in the previous year, but must be based on more objective criteria, which are the results, achieved in the past five years. Unlike the targeted (project) support directed at attainment of set targets, therefore to the future, the institutional support is intended for a long-term conceptual development of research organisations. Therefore it must bring along corresponding results, too (regardless of the source, from which they were financed). At the level of budgetary chapters, this criterion is adequate and at the same time very simple as far as the paperwork is concerned.

The administrator of the budgetary chapter through which the funds will be awarded will have the possibility to adjust the allocation of funds (similarly, this will be possible at the level of an organisation – such as a higher education institution); considerable corrections leading to the reduction in the number and quality of results will certainly lead to the reduction in the volume of funds in the next years. This economic mechanism will be also used to solve other problems in research and development from the reporting of equal results to multiple workloads. That department which allocates the R&D funds to organisations according to such criteria that won't

lead to results, will get less funds (and will be able to allocate less funds) in the next year. As well the organisations, in which people with multiple workloads will work (who will report their results with other organisations), will share these results with these other organisations (the sum of results for the Czech Republic as a whole must be 100%) and get less money. In order that adjustments at the level of budgetary chapters and organisations lead to strengthening the high quality and excellent research, they must be based on quality evaluation made through an internationally recognised and used methodology. The research organisations dealing fully or predominantly with research are using RAE (Research Assessment Exercise) methodology, which is common in selected range of EU countries (Germany, the Netherlands, Italy, etc.). The applied methodologies and results of evaluation must be published.

- Ad 2: The preservation of the present institutional form of support provided for the needs of specific research in higher education institutions would require three conditions to be met. Firstly, money should really go to all those who carry out research connected with education. Secondly, money should be allocated according to the criteria of the student's research work (and not absolutely different ones). And thirdly, money should go to its place of destination and must not be used in any other way. The responsible institutions - MoEYS in collaboration with the Czech Rectors Conference (CRC) and the Council of Higher Education Institutions (CHEI) - have not been able in the last four years to propose a mechanism that would meet these conditions and so it can be assumed that it does not exist. But the provision of institutional support would be largely complicated and demanding on paperwork even when all these conditions are met and that's why the targeted support was chosen.
- Ad 3: The research organisations will be supported as referred to in [3.2.](#) from budgetary chapters in accordance with [4.2.2.](#)
- Ad 4a: For the institutional support it will be also necessary to amend Act No. 130/2002 Coll. and other legal regulations so that they correspond with EU legislation. For example, the issue of institutional support to research organisations carrying out the applied R&D will be solved.
- Ad 4b: Today, results are counted in for the organisation which attained them no matter whether the given workers work in it or not. This leads to a considerable discrimination of new organisations (even if top world experts work in them, it will take five years until their results are fully counted in) and the organisational rigidity of the Czech research and development. If both organisations (old and new) don't agree on new reporting of results and the same results will be presented also by the new organisation for those workers, who are employed in it, half of the result will be counted in (or a proportionate part according to how many organisations reported this result).
- Ad 4c: See the Recommendation of the Research and Development Council on application of the Community Framework for State Aid for Research and Development and Innovation (2006/C 323/01).

The Reform will not have effect on the management of organisational units of the state and state contributory organisations on condition that they spend the R&D funds in compliance with the legal regulations of the Czech Republic and the Community Framework.

Ad 3.3. Cross-sectional R&D spheres

This part of the Reform defines four cross-sectional R&D areas and the conditions they will have to meet:

Ad 3.3.1. International collaboration in R&D

The reason for the existence of a cross-sectional area of R&D is that the international collaboration in R&D is one of the areas that can't be addressed only departmentally (from the view of only one department). Now it happens that the participation fee is paid by one ministry and the project support by

another and they are not mutually interlinked. There is no change of competence in the area of international collaboration in research and development; the responsibility for this area remains with MoEYS.

Ad 3.3.2. Security R&D

In the area of applied security research and development, the state must be the main user of its results; to ensure the population's security is one of its primary functions. This is a typical cross-sectional area of research and development that is at present aided from sixteen budgetary chapter without a mutual coordination and with many duplicities on one side and many necessary areas that remain unaddressed on the other. The security research is one of the most booming fields of R&D in the world. The Czech Republic has not yet been able to catch up with this trend. Individual, even very successful activities are not coordinated and the general drawback of the whole Czech R&D – too high number of providers, programmes and projects - clearly comes forward. As far as competencies are concerned, this cross-sectional area belongs to the security R&D of MoI. As with other cross-sectional areas, an interdepartmental concept will be made in the course of 2008 (for security R&D it is at an advance stage of preparations) and on its basis a programme will be submitted to the Government that will ensure all new activities in this area from 2010.

The issues falling under the competence of BIS and NBÚ will be further ensured by these bodies outside the research and development. These are issues unseparably connected with the activity and tasks of both these bodies that are subject to the act on classified information, where the definition of shares of R&D a other activities is very difficult. In most of the advanced countries these expenditures are not covered and reported within R&D (see inter alia the Frascati Manual). In the Czech Republic this has been solved as an exception pursuant to Section 4 (8) of Act No.130/2002 Coll. In case of BIS, another reason for this solution is the reform of intelligence services, too. Therefore in the draft state R&D budget for 2009 with outlooks for 2010 and 2011 the expenditures of ca CZK 30 mil (CZK 8 100 thous - BIS and CZK 21 731 thous - NBÚ) will be transferred from R&D expenditures to expenditures for activities.

Ad 3.3.3. Applied R&D of national and cultural identity

In applied research and development of the national culture and identity the state is the one who is primarily responsible as in other advanced countries. This field covers the practical utilisation of knowledge from basic research in humanities and social sciences (aimed at nationally-oriented knowledge in the field of history, culture, etc. – the so called National Reference Framework for Excellence (see [Ad 5.2.](#), point 1a)) for research and development of new products, processes or services. This is a typical cross-sectional area of applied R&D that is at present financed from twelve budgetary chapter without a mutual coordination and with many duplicities on one side and many necessary fields that remain unaddressed on the other. In this area like in the international collaboration in R&D and security R&D, an interdepartmental programme coordinating the so far strongly fragmented activities in this field is necessary. As with other cross-sectional areas, an interdepartmental concept will be made in the course of 2008 and on its basis a programme will be submitted to the Government that will ensure all new activities in this area aimed especially at practical utilisation of R&D results with participation of their users from 2011. Similar programmes focused on the “Economical utilisation of the cultural heritage” and collaboration of research organisations and enterprises are supported in many advanced countries (e.g. in Britain under the programme “Cultural Property Capitalisation”).

In basic research it will be realized through GA CR; the research and development for the needs of the state (e.g. social and economic R&D) assigned under public contracts will be under the competence of TA CR as in other fields.

Ad 3.3.4. Support of large R&D infrastructures

The sphere of support of large infrastructures for research and development will be receiving an important part of its resources partly from the EU Structural Funds (Operational Programme “Research and Development for Innovation”) and partly from the international collaboration in research and development (ESFRI and other activities), with MoEYS responsible for both of them. These two targeted resources, however, do not cover the whole area of support of large infrastructures for research and development and therefore the Ministry will submit a comprehensive concept. The support of large infrastructures is referred to in [5.1.](#) and [6.1.4.](#), too.

Ad 3.4. Sectoral R&D

This part of the Reform defines three spheres of sectoral R&D and conditions they will have to meet:

Ad 3.4.1. Applied agricultural R&D

Even if this is not a cross-sectional area of R&D, this field is specific by being hundred percently subsidised by the state budget by virtue of an exception in EC regulations and therefore it cannot be ensured by TA CR as other fields. While theoretically it is possible that programmes of applied research and development in agriculture are ensured by TA CR, too, one principal fact speaks to the opposite – the European rules, taken over by the Czech Republic, enable many exceptions for these programmes (especially one hundred per cent subsidy from the state budget) and it would be necessary to establish for them a special section in TA CR. This would be only a formal transfer from MoA to TA CR with all the associated risks and therefore they will be ensured by MoA. But only such programmes, or parts thereof, to which the EU exceptions apply will be under its competence and not those to which the exceptions do not apply and which will be ensured by TA CR as other research and development.

Ad 3.4.2. Applied defence R&D

In the applied defence research and development the state must be the main user of results because the provision of defence is one of its primary functions.

Ad 3.4.3. Applied healthcare R&D

In the area of applied healthcare research and development, the reason for the preservation of the budgetary chapter is mainly the Statement on the Government’s Programme in Part I. Public Health Reform, where the prepared changes (especially changes in the legal definition of organisations, etc.) will concern also the system of research and development in this field, but primarily must be solved and coordinated within its framework (unlike other sectors, here, there are no departmental research institutions and other beneficiaries of institutional support are public research institutions). Just about one half of the existing expenditures of the Ministry of Health on research and development has similarly as in other countries the character and outputs typical of basic research and therefore it will be targeted and granted by GA CR.

Ad 4. State administration in R&D&I

The fragmentation of research and development is a problem throughout Europe. In the Czech Republic, however, this problem is significantly more pronounced. There are too many providers in the Czech Republic (budgetary chapters) and too many small and medium-sized research programmes. Each of 22 chapters has its own historically given paperwork (forms, etc.). The largest fragmentation is in social sciences and in the field of public contracting in research and development. The result is that the excessive number of budgetary chapters further deepens all problems in the system of R&D support.

SWOT

Strengths: The Research and Development Council has already exceeded the function of an “advisory and expert body to the Government” and now it solves (or has to solve) many principal and conceptual issues of research and development at the national level of the Czech Republic. Part of the providers fulfils their obligations set by law, releases funds in time and attains adequate results.

Weaknesses: The fundamental drawback is long-term and trivial at the same time – considering its size and volume of expenditures the Czech Republic has the most budgetary chapters supporting research and development (22) in the whole EU. This fact, along with the decreasing number of workers involved in research and development in the state administration and their high fluctuation, results in a gradual failure of the whole complicated system of support of research and development in the Czech Republic. Each budgetary chapter, regardless of the amount of financial resources, must perform many duties not only within the Czech Republic, but also towards EU. With their growing number also the number of different interpretations of the same duties is rising (beneficiaries must learn 4 - 5 different systems), the sensitivity of the system to personal changes is growing, etc. Minimally half of work of the state administration in research and development is now spent on mutual communication of individual bodies without any direct outputs on the outside. And there are other system drawbacks. MoEYS does not fulfil the function of a “central body for research and development“, it is only one of the providers – in part of its activities it is substituted by the Council, other issues (where it has a direct responsibility – e.g. as a control body of OP RDI) remain unsolved. The position of regions is unsolved, the same conditions apply to them as to the ministries. The number of state administration workers in research and development in the Czech Republic are in Annex 4.

Opportunities: To use the Reform for a significant reduction in the number of budgetary chapters and simplification of paperwork to serve only for necessary activities at each respective level of management (application of the subsidiarity principle).

Risks: Insufficient reduction in the number of budgetary chapters or their selection according to other criteria (not corresponding with the model of support) – then neither the new system of R&D brings desired results.

Ad 4.1. R&D&I bodies

Ad 4.1.1. Research, Development & Innovation Council

Ad 1: At present, the Research and Development Council is already preparing the new R&D legislation (Act Nos. 130/2002 Coll., 341/2005 Coll., 171/2007, 379/2007 Coll. etc.) and proposes to the Government the allocation of expenditures on research and development, administers and operates the Information System for research and development, prepares conceptual strategic documents, evaluates the state of research, development and innovation in the Czech Republic, has prepared and evaluates the fulfilment of the National Innovation Policy of the Czech Republic, etc.

The proposed measure will project the existing situation into legislation, there are especially three changes as follows:

- The expansion of the responsibility and competence of the Council by law also to the area of innovation (today, this responsibility is imposed on the Council only by the Government Resolution No. 1354 of 19 October 2005).
- The transfer of responsibility for preparation and realization of the National Research and Development Policy of the Czech Republic from MoEYS to the Council with regard to its integration with the National Innovation Policy into a new National Research, Development and Innovation Policy of the Czech Republic (see [Ad 2.3.](#)). The Green Book on Research, Development and Innovation in the Czech Republic, prepared in cooperation with the Council as a standard document used in EU to discuss the issues of the new National Research,

Development and Innovation Policy of the Czech Republic is given in Annex V.7. The Green Book will be followed by the White Book on Research, Development and Innovation in the Czech Republic. The White Book will already contain the proposals for concrete measures to eradicate the barriers to development of the innovation-based competitiveness of the Czech Republic and will create factual grounds for formulation of a new National Research, Development and Innovation Policy of CR.

- The transfer of responsibility for the realization of R&D priorities being prepared so far by the Council in the form of main long-term directions of research, but should have been realized by MoEYS through the National Research and Development Policy of the Czech Republic, which has never happened.

Ad 2: The changes in the Council's competencies go hand in hand with changes in its composition. The proposed composition ensures a necessary balance between those, who make knowledge from money and those, who make money from knowledge, between research, development and innovation. Other issues of the Council's composition will be addressed in consequence to the amendment to Act No. 130/2002 Coll., in its Statute approved by the Government.

Ad 3: The measure solves the discrepancy in the present Act No.130/2002 Coll., where on one hand the Council is the "advisory and expert body to the Government", and on the other hand there are many tasks ensuring the execution of the state administration imposed on it. It is not new "central body", but an entity under the Government's control performing public administration tasks in the defined fields of R&D&I. Staffing for the Council will be solved together with changes in the state administration of research and development, similarly as financing of its activity under the budgetary chapter of the Office of the Government of CR.

Ad 4: The expert commissions of the Council established by law for only one purpose – preparation of the R&D priorities (main long-term directions of research) – will ensure the expert aspect of the Council's activity.

Ad 4.1.2. Grant Agency of the Czech Republic

Ad 1: GA CR will support also grant projects in basic research so far supported by the Grant Agency of the Academy of Sciences of CR (GA ASCR). The main reason is that even after five years GA AS has not been able to fulfil its mission set by law – to be a grant agency for the whole sphere of basic research, not only for the institutions of the Academy of Sciences of the Czech Republic (about three quarters of GA ASCR funds are granted to the institutions of AS CR, with GA CR their share is about half-size). The continuing conception of GA ASCR as an internal grant agency of AS CR is testified also by the composition of its Board (only workers of AS CR), orientation of grants ("Grants of markedly investigator character aimed at the field of research developed at present mainly in AS CR"), etc. Either also other entities (university institutions, other public research institutions, etc.) must have similar grant agencies for basic research or, as proposed in the Reform, all participants will have equal conditions in one grant agency.

Ad 2: GA CR itself should go through many changes, especially in the method for evaluation of the project proposals. Many proposals are marked with the highest marks, which not only does not correspond to reality, but one lower mark from an "poorly informed" opponent or member of the commission is enough for the proposal not to be accepted (see the report of the Auditing Department of GA CR for 2007). Thus the tasks imposed on GA CR by the Government Resolution No. 644/2004 are being fulfilled only in part. Like other institutions, AS CR may have an internal grant agency for better allocation of institutional funds, if their beneficiaries please.

- Ad 3: According to the Report of the Auditing Department of GA CR for 2007, the institutions whose employees are members of GA CR's commissions have markedly better success rate than others. This can be explained by claiming that only workers of the best institutions work in GA CR commissions, but in face of the public funds allocation this is not tenable.
- Ad 4: After establishment of TA CR and change in the R&D system in the Czech Republic it will be necessary to reevaluate the existing structure and focus of individual commissions of GA CR to really correspond with the disciplines of basic R&D and not applied one. At the same time, both agencies must have possibilities (or duties) given by law to cooperate with similar agencies in abroad.

Ad 4.1.3. Technology Agency of the Czech Republic

Mentioned are basic characteristics of the Technology Agency of the Czech Republic to ensure not only the applied R&D, but also utilisation of its results in innovation. The name TA CR, although deep-rooted, does not mean an exclusive focus on industrial technologies (e.g. the Finnish agency Tekes supports R&D in the field of, for example, global risks, power engineering and environment and application of biosciences).

The proposal for the establishment of TA CR is based on the model that has proved right in many countries:

Country	Name of Agency	Notes
Finland	<i>Tekes – Finnish Funding Agency for Technology and Innovation</i>	Tekes Agency was founded by the Government and equipped with considerable autonomy and powers in determination of both research priorities and structure and amount of spent funds. Important is the interlinking of public and private resources for project financing. The importance of the agency for the economic development of Finland over the last twenty years is indisputable.
Sweden	<i>Vinnova - Swedish Governmental Agency for Innovation Systems</i>	VINNOVA Agency was founded only in 2001, but according to the Swedish analysis of the public R&D support effectiveness it has brought a qualitative shift especially in the technology foresight. The Government only sets national economy targets and global directives. Another benefit is the increase in the share of private R&D financing.
Estonia	<i>ESTAG - Estonian Technology Agency</i>	The way and form of R&D support in the independent Estonia is going through similar development stages as in other states of the former Eastern Europe. But the strong and motivating example of the Finnish Tekes agency supporting the applied research is evident.
Ireland	<i>Enterprise Ireland – Agency for the development of the indigenous business sector</i>	The Agency for the development of the indigenous business sector (Enterprise Ireland) was founded as a governmental organisation with the task to assist in the development of Irish business sector. The principle of an agency enables a flexible response by the Office of Science and Technology to changes in R&D priorities and new stimuli arising from the own technology foresight and recommendations of the Forfás advisory board. This principle has proven right and in many economic and political analyses it is named as one of the main reasons for the Ireland's moving among the economically advanced countries.
Hungary	<i>KPI - Agency for Research Fund</i>	The Government has decided to make system changes in the applied R&D support and switch to an agency system of

Country	Name of Agency	Notes
	<i>Management and Research Exploitation</i>	independent selection of priorities and allocation of public funds.
The Netherlands	<i>NOW - The Netherlands Organisation for Scientific Research</i> <i>TNO - The Netherlands Organisation for Applied Scientific Research</i>	The Netherlands Organisation for Scientific Research (NWO) and the Netherlands Organisation for Applied Scientific Research (TNO) are mutually cooperating organisations founded under special regulations. The two institutions enable effective support of applied research and development. NWO manages and supports research in perspective directions and TNO aims rather to innovation and knowledge utilisation. Both institutions have characteristics of agencies with a high degree of independence in decision-making despite the fact that NWO allocates mostly public funds. Regional authorities and private sector participate more in the R&D financing through TNO.

Ad 4.1.4. Ministry of Education, Youth and Sport of the Czech Republic

Sums up the most importance competencies of MoEYS given in other parts of this material.

Ad 4.2. Budgetary chapters of R&D

Ad 4.2.1. Number of budgetary chapters for the targeted support of R&D

The measure summarises the main characteristics and number of budgetary chapters for the targeted support of R&D.

Ad 4.2.2. Number of budgetary chapters for the institutional support of R&D

The measure summarises the main characteristics and number of budgetary chapters for the institutional support of R&D.

Ad 4.2.3. Overall number of budgetary chapters for R&D support

It follows from the new system of targeted and institutional R&D support and number of budgetary chapters for the targeted (see [4.2.1.](#)) and institutional (see [4.2.2.](#)) R&D support that 22 budgetary chapters supporting the research and development today can be significantly reduced to 10, at the same time reducing R&D-related paperwork both in the state administration and with research workers.

Ad 5. Excellence in R&D

An excellent team or excellent workplace in basic research is such a team or workplace, the research results or preparation of scientific workers of which are recognised by the international scientific community, foreign teams and organisations are interested in cooperation with them, and there exists a provable foreign interest in training stays or work at such Czech workplaces. At public workplaces of applied research the excellence means a prompt and effective cooperation with the user's sphere and ready application of R&D results to products, technologies and services in international markets. The excellence is confirmed by benefits from the sale of licences, know-how, etc. The excellence is confirmed by evidential interest of foreign partners in research collaboration or purchase of research results, too. In the corporate research, the excellence is confirmed by a high share of R&D in the added value created in house and by presence of the company in international markets with high technologies based on in-house research.

The excellence in R&D is kept down by the existing system of R&D support that is based on averageness. Again, the reasons are many, from the historical ones (the democratic formation of the system that thus satisfied the average majority), to regional aspects, and the surviving opinion that any research is good and everybody has the right and entitlement to be supported in his or her research

activity. More than half of the publicly supported research concentrates in the capital – public R&D expenditures (Czech Statistical office, 2006 data): Prague 54.9 %, Brno (South Moravian Region) 15.6 %, Prague surroundings (Central Bohemian Region) 6.3 %, Ostrava and surroundings (Moravian Silesian Region) 4.3 %, České Budějovice 3.7 %, Olomouc 2.9 %, Pilsen 2.5 %, Pardubice 2.3 %, etc. Due to this, the results often do not stand comparison with the world and the benefits of research, development and innovation to the economy and society of the Czech Republic are very low.

SWOT

Strengths: Despite averageness in R&D, there are excellent teams and individuals attaining results comparable with the world in both basic and applied research. Particularly in some regions the private entities are investing their money into this area.

Weaknesses: The existing system of R&D support is based on averageness. This means especially the programme conditions and often dozens of criteria for the selection of project proposals in public tenders in R&D (the more criteria, the higher probability of average proposals succeeding), the method for evaluation of project proposals (where often only the highest marking is used and a lower mark for excellent /and non-typical/ project means its bad success), formal evaluation in the course of the project solution and at the end (where again the average not-departing-from-the-pattern projects succeed best), and evaluation of R&D results (where in 2006 figures the weight of the most quality results was only 61 %). In 2007 Evaluation it increased to 79 per cent, but the exclusion of articles in non-reviewed journals that were used in an overwhelming majority contrary to the rules as R&D result has raised a strong response and negative reactions by the affected persons. At the same time, it is a known fact that the management of research organisations and their representatives in many cases protected the individuals, teams and whole departments (institutions, faculties) with insufficient performance.

In the Czech Republic, several dozens of the so called centres of excellence were established having only very little in common with the European or world centres, often it is only a single laboratory. At the same time these “centres” are financed from the programmes of applied research and development, while often oriented on basic research, which significantly complicates the access to both the European Funds (RP EU are mainly focused on applied research, the structural funds on development of regions) and private resources. The concept of the European centres of excellence has been largely discussed within the large projects of OP RDI. These centres cannot serve exclusively to basic research and the follow-up projects hundred percent subsidised by state, because the ERDF fund from which they will be financed is intended for the development of regions and the results are evaluated by GDP/head increments and a close cooperation with enterprises is necessary expressed by their strong financial co-participation. The European centres of excellence must get involved in programmes of international collaboration and obtain large part of money for their activity from European funds. This is also connected with an unreal idea that the European centre of excellence can be built on a “green field”, that an institution (or their association) can become the centre of excellence through an official decision – without any history and researches who have already accomplished documented results in R&D in both basic and applied research and development. Without these preconditions, the public funds would be spent in vain.

At present, the excellence in R&D mostly requires expensive infrastructure and continuous replacement of apparatuses and equipment. This basic condition is also hindered by the existing system, partly by law (there is no legal form for association of higher education institutions and public research institutions and enterprises), and partly by the system of support – with rare exceptions the factually and economically desirable association of organisations and their mutual cooperation is not supported.

Opportunities: To use the Reform to make the shift from the present system to a true preference of excellence in R&D based on the attained results and to the economic motivation of cooperation between research organisations (especially between institutions of higher education and institutions of AS CR) and their cooperation with enterprises, especially in utilisation of the costly R&D infrastructure.

Threats: The preservation of the present state, which will lead to the problematic drawing and use of European money (large OP RDI projects), ineffective spending of public funds and factual obstruction of mutual cooperation between the organisations and with enterprises.

Ad 5.1. Centres of excellence and large R&D infrastructure

The aim in support of large (i.e. costly) R&D infrastructure is not the procurement of additional apparatuses and equipment, but their effective utilisation for the needs of research, development and innovation, which can't do without the cooperation of different sectors.

Ad 1: At present, there is no suitable form in the Czech legislation for establishment of joint legal entities (consortia). It is solved so far by form of interest associations of legal entities which is unsuitable owing to the purpose, very loose legal regulation and absent legal conditions harmonised with the EU legislation, etc. especially for expensive projects of hundreds of millions or billions of Czech crowns. The Community Framework provides for two types of consortia, which are characterised.

Ad 2: The measure follows up with the new way of allocation of the institutional R&D support. (see [5.2.](#)).

Ad 3: The measure gives basic conditions for procurement and operation of large R&D infrastructure.

Ad 4: One of the programmes of support of large R&D infrastructure from national resources will be the programme focused on its renovation and use in Prague.

Ad 5: The same conditions as to large infrastructure financed from the national resources must apply also to a large infrastructure procured by contribution of the structural funds.

Ad 5.2. Evaluation of R&D results at all levels

The results at national level must be evaluated in the same way as the Czech Republic is evaluated as a whole in various international comparisons. The more specific criteria are established at this level, the worse is the place of Czech Republic in international comparisons.

For the given purpose (the evaluation of results of research and development carried out by the Council with a view to allocate institutional funds at the level of budgetary chapters) the present volume of collected data about different types of results is unnecessary and corresponds neither with international evaluations nor the world trend (often only several most important results are evaluated abroad). Additional targets of the R&D support, such as promotion and popularization of the results cannot be evaluated and supported generally as yet (the true results are minimal then and do not correspond to the resources spent), but targetedly in the form of programmes with clearly defined targets, anticipated results (different from the standard R&D results) and criteria of their success or failure. Therefore a significant paperwork reduction at the level of the Czech Republic, both in the state administration and with individual research workers, can be achieved, besides the above mentioned steps (establishing TA CR), also by reducing the number of evaluated results in the Information Register of R&D Results (RIV).

Ad 1a): The world recognised results (publications with prestigious publishing houses and reviewed journals) are not fully identical with the results in Web of Science (in the so called. impact journals), therefore also publications in other reviewed scientific journals will be evaluated (with lower points). The list of these journals will be made and regularly updated once a year. On the other hand, for the disciplines included in the National Reference Framework of Excellence – NRFE (philosophy and religion; history; archaeology, anthropology, ethnology; politology; management and state administration; philology; literature; art, architecture, cultural heritage; pedagogy and educational system) the evaluation must be carried out mainly at the national level. These results (with exceptions) are not published in Web of Science and therefore the Czech (and Slovak) reviewed scientific journals will have higher evaluation points than in other disciplines. Similar approach will be taken for B type of results (professional monograph) – “book”: in NRFE disciplines they will have higher points than in other disciplines.

- Ad 1b): In the applied research and development, the evaluation will include patents with different points according to at what patent office they were filed, in light of their minimum number (for 2006, only 264 patents were awarded to domestic applicants, of them only 154 were reported as the result of the state-aided research and development). In realized technologies covering Z type of results (pilot plant, verified technology, variety, breed) and partly S type (prototype, functional sample, authorized software) only realized results will be evaluated according to their contribution (the price, for which the result is realized or sold) under the contract on the use of results. Certified methodologies or results realized by the provider that still belong to S type of results (applied methodology, applied research results projected into legal regulations and standards) will be monitored as separate types of results in the future and included in the evaluation only if they are certified and accredited methodologies or results projected into legal regulations, standards, directives, and non-legislative regulations binding within the competence of a respective provider, specialised maps with expert content with unambiguously demonstrable utilisation of R&D results.
- Ad 2: The evaluation drawbacks at other levels were described and tasks to their removal imposed by the Government Resolution No. 644 of 23 June 2004 on the evaluation of research and development and its results. The bulk of the already criticized drawbacks remains and responsible departments do not solve them (see the Government Resolution No. 539 of 23 May 2007 on the Summary evaluation of results of research and development programmes completed in 2005, evaluating at the same time also the fulfilment of the Government Resolution No. 644 of 23 June 2004 on the evaluation of research and development and its results and the system of provision of public funds on research and development in individual departments).
- Ad 3: The Information System for research and development serves not only to the Council, public and the beneficiaries, but is intensively used by individual providers.

Ad 6. R&D Programmes

An important part of the research supported from public funds (particularly that part, which is supported under the programmes of applied research) behaves as basic research and gives priority to outputs in the form of publications, even if they bring nothing new to the world science. No country can afford it in this scope (99 % of all results). The gradually introduced system of evaluation increases pressure on research and development to produce results that are utilisable in economy and society, but the changes are still too small. The agreements on collaboration with the application sphere are mostly formal, the financial co-participation by private funds is missing.

SWOT

Strengths: In the last years, the pressure has been gradually applied on results, formulation of the programmes of applied research and development and their evaluation. This will, however, show itself only after a long time, now the programmes commenced at the turn of the millennium are evaluated (with drawbacks mentioned below) and the programmes commenced now will end in 2013 to 2015.

Weaknesses: The drawbacks described in SWOT for the objective (1) for the system of R&D support “the annual evaluation of completed programmes shows that in many cases the results don’t correspond to the declared targets and that large amounts were spent ineffectively, have several common reasons. The first one is the incorrect interpretation of the definition of programmes in the act (the act correctly says “of basic **and** applied research”, but it is incorrectly interpreted as “of basic **or** applied research” and the programmes focus only on basic research). The second one is the preparation of the programmes themselves that often stems from mapping the scientist’s (investigator’s) needs and not the needs of users of the programme results, the concept (R&D strategy) at the level of departments, on which they should be based, is missing. The standard preparation of a concept and follow-up programme must contain, among other things, answers to following questions: what are the problems of a given sector (discipline, etc.), are these problems solvable through R&D (this includes also a time factor – R&D are available in

a relatively long time concept), etc. The third systematic problem is that an overwhelming majority of programmes is general-purpose, the so called thematic programmes (focused on a certain theme, on the R&D priority) are exceptions (around 10 % of funds). The programmes are conceived for everyone to be able to find him or herself in it, the priorities or their projection into the programmes are missing. At the level of programmes, even more than at the level of projects, the absence of continuous and especially final evaluation is seen, nearly all the work concentrates on evaluation of proposals.

Considering the number of budgetary chapters, the individual programmes are conceived in a strictly departmental way (with several exceptions). As a result the projects factually overlap and duplicities occur. This negative phenomenon is particularly prevalent in cross-sectional R&D areas (international collaboration in R&D, security R&D, applied R&D of national and cultural identity and support of large R&D infrastructures).

In the applied research and development, there is an obligation of the department (provider) set by law since 2002 to conclude a contract with the beneficiary on the use of results. With some exceptions (e.g. MoIT and MoA) the departments are not doing so, which means that they behave as providing programme support to basic research (which is a factual and legal mistake). In basic research that aims at widening the world knowledge (“to acquire knowledge of the underlying foundations of phenomena and observable facts and explanation of their causes and possible impacts with use of the acquired knowledge”) no standard programme with clearly defined targets, criteria for their attainment, etc. can be formulated and therefore the support is targeted through grants.

The co-financing of programmes by public (state) and private resources, with the exception of MoIT programmes, is practically non-existent. Even where the co-financing has been introduced, the share of private resources is minimal and mostly they are not the resources of future users of programme results (enterprises), but the resources of investigators (research organisations). Thus the main reason for co-financing disappears – to engage the future user of results in the solution, allow the transfer of knowledge, etc.

The national programmes of research in the existing concept have not proved successful; they attain worse results than other R&D programmes. The National Research Programme I has remained at the level of freely connected departmental programmes roofed under a non-specific direction and coordination (with unclear competencies) of MoEYS. The National Research Programme II was concentrated under two coordinators (MoEYS and MoIT), but especially in MoEYS programmes it remained at the level of an object of solution defined in a great detail, but without concrete targets, anticipated results, etc; to a great extent it is a set of basic research projects (and not the programme of applied research and development with adequate results).

The existing act does not solve correctly the issue of national regional research programmes; according to the present wording, these programmes are approved by the Government and not the region.

In the area of international collaboration, suitable forms of targeted support (programmes) are missing that would enable the Czech Republic to become involved in new forms of international collaboration in R&D, especially within the European Research Area.

Compared to other countries, the system of indirect support of research and development has started to be introduced late in the Czech Republic, which is one of the reasons of the foreign investments into “assembly halls” instead into sophisticated productions using research and development. Since 2005, the deductibility of costs of research and development from the income tax base has been introduced (equivalent to 24 per cent subsidy from the overall costs, without those many disadvantages of a subsidy). In addition, R&D is indirectly supported by exemption of the property, acquired free of charge (by public research organisations and public higher education institutions) and intended for financing the research and development, from the inheritance and gift tax (2005) and by VAT refund with EU projects, etc. In the system of indirect support of research and development, especially the support to collaboration between research organisations and enterprises is missing.

Opportunities: To use the Reform to make changes in the existing system of preparation, realization and evaluation of results of the applied R&D programmes.

Threats: The preservation of the existing number of the departmentally conceived programmes (i.e. existing or moderately reduced number of budgetary chapters for research and development) leading as a result to wrong allocation and use of R&D expenditures.

Ad 6.1. Introducing a new system of applied R&D programmes

Ad 6.1.1. Programmes supported from TA CR budgetary chapter

TA CR will start its activity in successive steps not only due to the gradually increasing available resources, but especially for factual reasons (the system must be at first introduced, consolidated, the best processes chosen, etc.) .

- Ad 1a: A competent department must be responsible for preparation of programmes following up with the concept of development of the sector in question.
- Ad 1b: This condition results from, among other things, the Community Framework, which does not distinguish between the industrial and non-industrial applied research.
- Ad 1c: As is repeatedly seen in the final evaluation of programmes after their end, for most of them the targets, etc. have been set as very general and declarative and therefore it is practically impossible to evaluate their fulfilment. The programmes approved by the Government in 2007 already meet many of the basic attributes considering the fact that the Council has returned them several times for rewriting.
- Ad 1d: In view of the fact that programme is approved by the Government, while only provider alone is responsible for the tendering documentation and the system of acceptance, assessment and evaluation of project proposals, it is unique for every department and distinct from the others. In addition, the criteria for evaluation of project proposals often strongly change the targets approved by the Government (e.g. criteria for targets approved by the Government were given a zero weight in the tendering documentation, etc.). Tasks imposed by the Government Resolution No. 1260 of 29 September 2005 on the proposal to unify the research and development paperwork are mostly ignored by the providers and the cancellation of a public tender in R&D after its announcement (when these documents are available) only for this reason is not possible under the existing legislation.
- Ad 1e: Like today, the programme proposals before their discussion in the Government will be commented on by the Council, newly also by TA CR (instead of MoEYS) that will realize the programmes.
- Ad 2a: Considering the fact that programmes are approved by the Government prior to starting the works on the state budget, the most effective solution would be to include the programme expenditures into the TA CR budget right away.
- Ad 2b: The fund provider, i.e. TA CR, must be responsible for the public tender in R&D, control over the individual project solutions and attainment of set results.
- Ad 2c: The fulfilment of the programme objectives must be supervised by the provider; the Council and the department that proposed the solution of the given programme to the Government will be able to suggest necessary changes.
- Ad 2d: Unlike the present state, the provider (TA CR in this case) will be obliged to evaluate and verify the results attained by solution of respective projects.
- Ad 2e: Like today, the summary evaluation of all programmes completed in a given year will be submitted to the Government by the Council.
- Ad 3a: The possibility of changes in the responsibility for the programmes and projects being already solved and transfer of the existing commitments of providers to TA CR is only theoretical; this

would mean changing the contracts, terms and conditions of solutions, etc., which is practically non-realizable in a given period.

Ad 3b: Where it is advisable to arrange new rounds of public tenders in R&D even in 2010 in order to fulfil the programme targets, they will be arranged by TA CR. If it be to the contrary (arranged by existing providers), the transition period would unbearably lengthen.

Ad 3d: New programmes commencing from 2011 will be fully ensured by TA CR – in 2009, it will be established by law, in 2010 the public tender in R&D will be conducted, and the new programmes will commence from 2011.

Ad 6.1.2. Cross-sectional programmes of international collaboration (MoEYS)

Ad 1: For the programmes of international collaboration in R&D of this type, the principle introduced by Act No. 171/2007 Coll. will be preserved. In preparation of the amendment to Act No. 130/2002 Coll., the possibilities to simplify the provision of funds in accordance with the EU legislation will be searched for.

Ad 2: The programmes of the second type will not differ in principle from programmes realized by TA CR. Costs of their solution will correspond to anticipated results.

Ad 3: Also for the programmes of the third type the overall support (the participation fee and support of respective programmes or projects) will depend on the anticipated results and benefits, the mechanism for their approval will be different. Prior to making the commitment of the Czech Republic, the programme must be approved by the Government.

Ad 4: The programme of the fourth type includes classic bilateral agreements on bilateral scientific and technical cooperation with a minimum financial volume (ca CZK 13 mil/year). Individual agreements are specific, covering not only the area of R&D and therefore must have their specific targets.

Ad 6.1.3. Cross-sectional programmes of MoI and MoC

Ad 1: These programmes have certain specificity. The first one is the fact that user of the major part of results is the state who is responsible for security and care of national and cultural identity (cultural heritage, etc.). On this account they cannot be realized by TA CR and for public tenders in R&D the competent provider will be responsible. In addition it is true that present purely departmental concept did not ensure collaboration on the side of individual departments and especially the beneficiaries (the beneficiaries were mostly only organisations of a given department).

Ad 2: Considering the fact that one of the targets is to reduce the existing fragmentation and redundant number of R&D programmes, their number is limited.

Ad 3: For the cross-sectional R&D programmes, the same model is introduced as for the programmes realized by TA CR; it is not necessary to wait for adoption of a new law and that's why they can be commenced already in 2010 (MoI) and 2011 (MoC).

Ad 6.1.4. Programmes of support to large R&D infrastructures

Ad 1: The National Research Programme III will ensure the activity of capacities built under OP RDI and OP EC. Considering the necessary links to OP RDI (sustainability of OP RDI is one of the principal issues of this programme not only for the Czech Republic, but also for EU), it will be realized by MoEYS.

Ad 2: The same conditions as the EU Structural Funds-aided projects must have also projects that are supported from other EU resources.

Ad 3: It lays down the basic conditions for support of large R&D infrastructure from national resources that will be specified in preparation of the amendment to Act No. 130/2002 Coll.

Ad 6.1.5. Sectoral programmes of MoA, MoD and MoH

For sectoral programmes, there will apply the same conditions as for others (see [6.2.](#)).

Ad 6.1.6. Specific R&D programmes

There are practically no specific R&D programmes in the Czech Republic focused on encouraging the transfer of R&D results, popularization, etc. The usefulness and suitability of these programmes must be proved by the National Research, Development and Innovation Policy for a given period (these programmes will be one of the instruments for its realization).

Ad 6.1.7. Regional R&D programmes

This is the correction of one not properly considered provision in the present act, under which the regional R&D programmes should be approved by the Government.

Ad 6.2. Principles applicable to all R&D programmes

Ad 1: As a result of the Council's sustained pressure the anticipated results of the programmes are formulated in approving new programmes in the last year. This is, however, only the first step, the basic one is still missing – to say how the results will be used. This is connected with the change in the concept of the programme preparation, the change in the concept of programmes of applied research and development conceived so far according to the investigators' needs towards the programmes conceived according to the users' needs. According to the attained results and their utilisation, the programmes will be evaluated and the acceptance of follow-up programmes will be determined.

Ad 2: In the applied research and development, to which the programmes exclusively relate, there exists a concrete user, who has benefits from utilisation of the results. The state or public resources respectively may participate in the financial support only partly (see the Community Framework). Unlike the Czech Republic, in abroad the private resources participate in programme financing also in sectors such as public health (pharmaceutical firms) or environment (manufacturers and users of ecological technologies, etc.). New programmes of applied research and development will be supported only in case when their co-financing is ensured.

Ad 3: So far the programme targets were set at first and the selection of project proposals was then made according to other criteria – not according to how the applicants can contribute to the attainment of these targets, but whether they are successful in writing scientific articles. Many of the current departmental rules for evaluation of project proposals are based mainly on evaluation of the applicant's past and not on his or her ability to fulfil the programme targets. Thus one of the main differences between the targeted and institutional support is wiped off and the unsatisfactory present state preserved. The result is that in many programmes of applied research and development the scientific articles dominate over patents, new products, technologies, processes, etc. For the programmes, where the participation of business sector and private co-financing are anticipated, the evaluation will include also evaluation of the ability to meet own financial liabilities.

Ad 4: Many projects of research and development are purely formal – clear target is missing (“we will examine the problems of ..”), as well as criteria of its attainment (“funds will be used in compliance with regulations ..”), way of its attainment (“this problem started to be solved in the 19th century by ..”), etc., despite many steps made towards correction (see the Government Resolution No. 644/2004 and others). The observance of basic principles of project management will be strictly requested, controlled and their non-observance penalised.

Ad 5: Anywhere in the world the research project is the matter of the team, in the Czech Republic considering the system it is in many cases the matter of individuals (to whom the given institution does not grant necessary support and in many cases it internally non-transparently redistributes the allocated resources). Each year, about 5 500 very small projects are solved, with one scientist solving at once 2.5 projects on average (and research plans in addition), but reported are cases of ten and more projects. The administrative control through capacities have not proved too good.

This situation considerably contributes to the opinion that nearly everything is possible in the Czech research (which leads to the departure of young researchers and other consequences). Such poor utilisation of the research support is based mainly on low informedness (and interest in it) both in individual departments and institutions. Besides the above mentioned measures, the extreme cases of public funds mishandling will be published.

Ad 6.3. Indirect (tax) support of R&D&I

The aim of the indirect support (taxes) is to have a system which will stimulate the cooperation of enterprises with higher education institutions and public research institutions that should be more advantageous in terms of taxes than the tax deductions for R&D applied within one institution or enterprise. This will strengthen synergies between the business and academic spheres and the multiplicative effects (interconnection of top research and education, encouragement of establishment of research universities) will rise. The purpose is not only allow the public procurement by enterprises to be contracted to research organisations, but mainly stimulate them to establish their workplaces in the research institutes and at universities, which is the basis of a true cooperation of these sectors. The support of research purchased from higher education institutions and public research organisations will stimulate enterprises to invest into this area and collaborate with research organisations. The condition will be that such research will not be covered from public funds and that the deduction will not be applied by both the purchaser and the seller.

Ad 7. Research organisations

Introduction of a research plan-based institutional financing did not bring the necessary dynamics into the organisational structure of the public research. While in abroad the institutes in this area are born and die, their focus (research programmes or their plans) considerably changes, their management radically changes, etc. the changes in the Czech Republic are basically negligible. Research universities, or faculties, are missing.

SWOT

Strengths: The focused and relatively strong basic research in the Academy of Sciences of the Czech Republic is concentrated in 3 main areas - Prague, then Brno and České Budějovice. The high growth of share of research in the activities of higher education institutions and the commensurate growth of high-quality results (see the Evaluation of research and development and its results in 2007).

Weaknesses: Low long-term interest and support of the state administration to the organisations of applied research and development (the neglect of research base was caused mainly by ill-considered privatisation and inactivity in consequent years) and resulting forced substitution of their functions by other organisations. Absence or very low utilisation of economic instruments supporting the mutual cooperation between research organisations (particularly higher education institutions, institutes of AS CR and departmental research institutions) and even more the cooperation with enterprises. Deformation of the original idea of research plans and their overall proportions (in 2005 to nearly 2/3 of the overall R&D support); in many cases the funds have been allocated contrary to the recommendations of expert commissions for seven years without any feedback to attained results. The impossibility to use the funds on research plans anywhere else than in a given institution.

The way of allocation of resources to education in higher education institutions that would strengthen their motivation to produce graduates for the labour market has not changed too much yet. The system still survives, under which the overwhelming majority of resources is allocated according to the normative per student, i.e. for what he is doing and not for what he will do. This is one of the reasons why the cooperation of higher education institutes with enterprises in the area of preparation of study programmes does not work and as a result the profile of graduates and their knowledge and expertise in many cases does not correspond to the needs of enterprises.

On one hand, the public higher education institutions and to a less extent (owing to more recent legislation) also public research institutions are independent legal entities with all its consequences, and on the other hand their system of management is not economically prepared for such independence. This

issue gains topicality at present when public higher education institutions and public research institutions are beginning to acquire larger portion of funds from other resources than their provider (who has solved so far all problems, even in a non-standard way) – from structural and other EU funds, from private resources, etc.

Opportunities: To use the Reform and opportunities offered by the EU Structural Funds 2007 – 2013 to change both the system of R&D support with positive effects on the so far organisational rigidity in the research organisations and the way of their financing and management. To strengthen the cooperation of research organisations and higher education institutions with private sector in the preparation of graduates.

Threats: The preservation of the present state, the existing system of R&D support and way of financing and management of research organisations that will lead to their isolation and stagnation.

Ad 7.1. Measures resulting from the change in the R&D support system

Ad 1: The result of this change will be especially the transfer of decision-making in funds for long-term development of organisations from the level of ministries (where decisions were taken in funds and often in the research plans orientation) to the organisations themselves. Whether the organisation uses these funds for attracting (or retaining) skilled workers, investments into new apparatuses and equipment, cooperation with other organisations, etc. will depend on it with only one single condition – money must be used on research and development and bring results.

Ad 2: Large infrastructure for R&D at the world's top level may be supported by a country having the size of the Czech Republic only when it is jointly utilised by more research organisations of different types, is significantly involved in international collaboration, especially the collaboration with users, and in education.

Ad 3: The establishment of TA CR will significantly contribute to the eradication of departmental barriers between the research organisations falling so far under different providers.

Ad 4: The use of structural funds will result (especially in large projects of OP RDI) in a considerably closer collaboration of research organisations and enterprises.

Ad 5: The obligation of research organisations to create a functional system of the intellectual property rights protection, and transfer and commercialization of results will lead, among other things, to a closer collaboration with enterprises, formation of many new institutions and encouragement of spin-offs.

Ad 7.2. Additional measures to set into motion the rigid organisational structure of public research

Ad 1: This is primarily an economic matter – the higher education institutions must be financially motivated to produce high-quality graduates prepared for their employment.

Ad 2: The amendment to applicable legal regulations on higher education institutions (namely Act No. 111/1998 Coll.) will strengthen the role of those bodies that are responsible for management of the public higher education institution and its results. Similar changes will occur, to a less extent, in the public research institutions (some of them are already contained in Act No. 341/2005 Coll., because it is more recent).

Ad 3: The amendment to applicable legal regulations on higher education institutions (namely Act No. 111/1998 Coll.) will enable to the public higher education institutions, for example, to establish workplaces with corresponding personnel background financed by private resources.

Ad 8. Workers in R&D&I

The whole Europe suffers R&D workers shortage, but the Czech Republic in particular. This is caused, among other things, by the lack of interest of young people in the career of a research worker,

insufficient mobility of research workers and low attractiveness of the Czech Republic for both young research workers and experienced top researchers.

SWOT

Strengths: The tradition of technical studies in the Czech Republic, the gradually enhancing knowledge and skills of the higher education graduates in many disciplines appreciated by foreign investors. Many supranational firms have established and are establishing their research and development centres in the Czech Republic.

Weaknesses: The poor age structure in Czech R&D in the category of young researchers has improved, but they are leaving R&D and in the middle age category (between 35–55 years) key workers with enough experiences in management of demanding projects are missing. On the contrary, in the higher age categories the share of R&D workers is high, dominant is the representation of these age categories in the project management or R&D management in general.

Only slowly eradicated barriers for long-term work stays of foreign research workers in the Czech Republic. Top managers from abroad are recruited only sporadically, e.g. 40 per cent of the directors of Max Planck Institute in Germany are foreigners; the current Chairman (President) of the European Research Council is Greek, etc. Only in 2007, the amendment to the act on the stay of foreigners and act on public research institutions (Act No. 379/2007 Coll.) succeeded in legal anchoring of a simplified procedure for recruiting scientific workers from the countries outside EU. The disadvantage of the amendment is that it is not well-organised due to the structure of the act on stay of foreigners. Insufficient mobility of workers between the academic and application sphere. Highly varying is quality of students in the doctorand study programmes. Insufficient inflow of top pedagogues and R&D workers into the Czech institutions of higher education and research institutes. Insufficient knowledge of state administration R&D workers and their frequent fluctuation. The EU Structural Funds 2004 – 2006 resources have not been used yet, with exceptions, to increase knowledge and skills in the area of research, development and innovation.

Opportunities: To use the EU Structural Funds 2007 – 2013, namely OP EC to provide experts for research, development and innovation.

Threats: The unsecured implementation and use of funds for OP EC, its continuous coordination with OP RDI and OP EI. The departure abroad of graduates who obtain their high-quality education free of charge in the Czech Republic.

Ad 8.1. Operational Programme Education for Competitiveness

The basic attributes of the Operational Programme Education for Competitiveness that will contribute to providing an adequate number of experts for research, development and innovation, are given in Annex V.3.3.

Ad 8.2. Additional measures to provide experts for research, development and innovation

- Ad 1: As a follow-up to changing the model of the institutional support, the specific research in institutions of higher education will be replaced by a new form of targeted support provided by MoEYS (see Ad [3.2.](#), point Ad 2).
- Ad 2: It apparently goes without saying that the best results in research and development are attained by these workers. If the growth in the number of workers is needed, it must take place mainly in this age category (in higher age categories, it is often the question of multiple workloads).
- Ad 3: The career rules will offer to the research workers the possibility of growth, i.e. a clear idea of what is waiting for them in the given institution. The career rules will fall under the competence of the given organisation (e.g. as its internal regulation).
- Ad 4: By amending Act No.130/2002 Coll. (and related Act Nos. 341/2005 Coll. and 326/1999 Coll. /as amended by Act No. 379/2007 Coll./) all uncertainties concerning their interpretation will be finally resolved in order that the research organisations and enterprises can acquire these experts with a minimum of paperwork and become thus competitive with offers from other countries.

Ad 9. International collaboration in R&D

The formal participation in the preparation of important EU documents for R&D, insufficient participation of the Czech research in the Framework Programmes, the reluctance and lack of capacities for participation of the Czech Republic in the more efficient coordination of national strategies, policies, programmes and initiatives in R&D within EU. Low cohesion of national and international activities is visible especially in the area of the EU Structural Funds, in the R&D links to innovation, and others. The foreign resources in R&D are understood as “something extra” and not the alternative – solution of what the Czech Republic is not able to cope with.

SWOT

Strengths: The active and well-functioning National Information Centre for European Research in the Technology Centre of AS CR. Relatively well-functioning national information network of regional and professional contact organisations in the Czech Republic – NINET. The organisations associated in NINET provide information and consulting services on the EU Framework Programmes of research and development.

Well-thriving activity of the Czech Liaison Office for Research and Development CZELO in Brussels that was established after many delays in 2005.

Good level of preparation of younger research workers in the Academy of Sciences of CR and in many other institutions of higher education for study, training and practice.

The membership of the Czech Republic in prominent international organisations such as CERN (European Organisation for Nuclear Research), EMBO (European Molecular Biology Organisation), ESA (European Space Agency), and ESO (European Southern Observatory) ensuring the possibility of participation of the Czech research workers and Czech firms in top research carried out on costly advanced research facilities and in the development of special instruments for these international organisations.

Weaknesses: The surviving purposeless approaches to international collaboration in R&D – collaboration for mere collaboration and not for faster and more effective achievement of better results. This especially applies to certain bilateral collaborations provided on the basis of governmental or ministerial agreements, where the main reasons are the foreign policy objectives.

Still insufficient utilisation of results of the international collaboration in applied research in the innovations of products, technologies and services. In connection with both mentioned drawbacks, it is advisable to mention the intent of Finland from the beginning of 2007 to reevaluate the scope of their international collaboration in R&D and limit it only to cases when the set targets in R&D may be useful for Finland. Relatively better is the situation in collaboration within EUREKA programme. The barriers are not the insufficient rights to use the attained results and acquired know-how, but poor coordination of the activity of Czech representatives in various commissions, programme committees, and EU work groups dealing with R&D on the part of the state (the information and consulting activity provided by TC ASCR, CZELO office in Brussels and NINET networks is not enough to replace this poor coordination at the state's level).

The drawbacks of participation of the Czech Republic's representatives in the preparation of documents and opinions for the EU Council meeting on “Competitiveness”, in the informedness on the results and fulfilment of conclusions from this meeting. The earlier uncontrolled decision-making on the directions of international collaboration not reflecting the Czech national priorities. Institutional, organisational and personal unpreparedness for drawing EU funds for implementing the policy of cohesion in 2007–2013, as well as on R&D development.

Opportunities: The possibility for the Czech research workers to take part in the large EU research infrastructures being built (ESFRI Road-map).

The possibility for the Czech research workers to take part in the prepared European Technology Institute.

Experiences of the Czech research workers with participation in the 5th and 6th EU Framework Programmes and more often taking the role of coordinators of larger projects of collaboration.

Markedly increased EU support of basic research provided by the European Research Council that focuses particularly on excellent research workers.

New possibilities of collaboration in R&D motivated only by the needs to increase the R&D benefits to economy and society with dynamically developed and advanced research capacities in China, India and other countries.

The possibility to acquire high-quality and perspective research workers from less developed countries of the Southeast and Eastern Europe and other territories.

Threats: The risk that results of applied research attained with the participation of Czech researchers and their know-how will be used only by the collaboration partners and not the Czech Republic. The access to all results and know-how acquired within the collaboration in applied research is relatively well protected only in the EU Frameworks Programmes.

Temporary or permanent departures of Czech research workers to countries providing better conditions for research and development (brain drain).

Ad 9.1. Measures resulting from the change in the R&D support system

The measures are explained in the respective points (3.3.1., 4.2.1. and 6.1.2.).

Ad 9.2. The use of European resources as public expenditures on research and development for innovation

Ad 1: In the time of a considerable drawing of EU funds for research and development for innovation that will amount to 59 per cent of the volume of national resources (CZK 23 bn from national resources and CZK 13.5 bn from EU resources will be spent on R&D in 2008) there is no other way than put the effective utilisation of these funds as a priority.

Ad 2: Low cohesion of national and international resources had negative effects even in the past (until 2006), but in the time of a considerable drawing of EU funds for research and development (CZK 23 bn from national resources and CZK 13.5 bn from EU resources will be spent on R&D in 2008) its solution becomes a priority. Likewise other countries, the Czech Republic will determine what will be covered from national resources (what it will manage itself), what will be financed from EU (whether in collaboration with other countries or under the conditions of EC) and what it won't do at all. These three blocks must be balanced in the country having the size and resources of the Czech Republic.

Ad 3: The existing priorities of research and development (MLDR) will be reviewed particularly from this point of view to ensure effective utilisation of national and European resources – not to have one field of research with ten newly established research institutes in each region (without any link to the utilisation of results in innovations) – and other field of research with no institute at all.

Ad 9.3. Definition of OP RDI in light of the Reform

The Operational Programme Research and Development for Innovation is by its scope and focus in the sphere of research, development and innovation the most important especially after 2015. The Reform concerns OP RDI namely in parts 2.2., 3.3.1., 5.1. and 6.1.4., with explanation of these measures.

Ad 9.4. Additional measures for involvement of the Czech Republic in R&D&I within the EU and other international collaboration

- Ad 1: The existing concept of international collaboration in R&D like other concepts did not contain the amounts of financial costs of realization of proposed measures. At present, MoEYS has this concept ready and it will be submitted to the Government by 30 June 2008 after the Reform is approved.
- Ad 2: The opinions and positions presented by the Czech Republic's representatives in various commissions, programme committees, EU work groups dealing with R&D on the part of the state are still uncoordinated. For example, in many accepted commitments leading to increase in R&D expenditures, the position has not been discussed with the Council at all; similar is the situation of other bodies. The still classic information is the travel report with limited access with agenda and account for expenditures. Basic characteristics of this system has been already prepared by MoEYS and discussed with the Council, but in view of situation in 2007 it has not moved any further with the preparation.
- Ad 3: In case of any new possibility for international collaboration it will be carefully analysed and weighted, if such collaboration is advantageous and beneficial for the Czech Republic. In case of the existing commitments of the Czech Republic, if not containing the commitment to concrete amounts of funds, these criteria will be applied in decision-taking about the amount of support provided for research and development from the state funds.

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