

# Czech Position on the Green Paper - From Challenges to Opportunities: Towards a Common Strategic Framework for EU Research and Innovation Funding

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Science, research, development and innovation are sectors with extremely high impact on the knowledge based society. The dynamics of financing research systems are as important for sound development of human welfare as the dynamics of changing conditions of natural resources availability. In the current interconnected world big challenges facing European and global societies can be successfully resolved only when research and innovation efforts are joined properly.

The Czech Republic considers the uncompromised accent on ***excellence of research activities*** to be the leading principle for financing research and innovation in the coming programming period. In order to take full advantage of the knowledge potential of Europe, it is important to provide ***access based on excellence***<sup>1</sup> to smaller Member States to such activities as Joint Programming, European Innovation Partnerships and research infrastructures. The Czech Republic considers frontier research as a precondition to top - level innovation. Besides innovation based on research, support to innovation in the broad sense with European added value, including non-technological innovation (like new business models, design, new ways of marketing etc.) must be ensured. Radical changes in technologies cannot be properly used without changes in the environment surrounding them.

In addition to this, the ***priorities and resources*** available on the European level, relevant to research and innovation should be coordinated and streamlined (FP7, CIP, EIT). Considering the name of the new framework we underline the importance of the well established ***trademark*** of the “FPs”, which should be taken into consideration while choosing a name for the new strategic framework, thus ensuring the ***continuity*** of endeavours on European level in research and innovation.

- **Working together to deliver on Europe 2020**<sup>2</sup>

The new strategic framework should make European research and innovation more attractive for researchers and innovators in the first place by **simplifying the access and rules of participation** to the programmes.<sup>3</sup>

The CZ supports an effort to move towards the use of uniform and user-friendly IT tools for all EU programmes supporting research, development and innovation. Such

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<sup>1</sup> The excellence to be secured by using international peer review for the evaluation of projects

<sup>2</sup> Detailed Czech views on the thematic and horizontal themes of the new framework are in Annex 1 to this document.

<sup>3</sup> Detailed Czech views on simplification are in Annex 2 to this document.

arrangement would indeed result in savings of financial resources and synergies allowing the coverage of the whole innovation cycle. Existing inter-personal contacts and knowledge accumulated by EEN staff<sup>4</sup>, and the experience of national contact points for the FP7 gathered over the last years should be taken into consideration.

The EU funding should **cover the whole innovation cycle from ideas to market in a limited number of strategically chosen areas** reflecting the challenges of our society.

The Joint programming initiatives should be in the centre of such endeavours, linked to the European Innovation Partnerships. More demonstration and innovation activities should be an integral part of such a concept. A framework designed in this way could increase the EU added value, as joining forces on national levels within the Joint programming initiatives would be complemented by problem solving on EU level. Nevertheless, calls by the EC, or the participation of the EC in the Joint Programming initiatives should provide access based on excellence to these activities for researchers and innovators from Member States (and third countries), which are not partners in a particular Joint programming theme. The same mechanism could be applied for the EIP initiatives.

A stronger link between the successor of CIP and FP7 should be created. For example direct support to the projects enabling the R&D results (especially those stemming from a programme in the common strategic framework for R&D support) to reach the market could be provided. In other words, much stronger, aggressive market-oriented, practical support of individual projects in the programme at the end of the innovation cycle would be an asset.

It is also important to scrutinize all phases of the full innovation cycle, especially how, and to what extent the phases are financially supported. For example, insufficient financing seems to prevail in the following phases of the innovation cycle: initial phase of the invention development (lack of seed capital), proof-of concept phase (lack of capital and companies carrying out proof-of-concept).

When speaking of tackling societal challenges and European innovation partnerships we would like mention the application of the demonstrator approach (outlined by the Expert Panel on Services Innovation in February 2011). Demonstrators provide a way of de-risking innovation, and catalyzing large scale improvements in economic performance, by providing a staged process in which a range of solutions are initially developed, tested and then selected for further rounds of support.

The size of a project and the number of consortium participants should express the project's objectives. Not only scientific and economic criteria have to be applied in all cases, as the European programmes for research and innovation are also community

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<sup>4</sup> Enterprise Europe Network - 600 partner organizations in 48 countries, around 2,500 partnership agreements per year involving European SMEs, 800 proposals submitted by SMEs to FP7 etc. Advantageous aspects of the EEN are serving SMEs (including small businesses and crafts), direct access to services given free of charge to SMEs without administrative burden for them and the fact it already is a one-stop-shop.

building tools. In the case of innovation support smaller scale projects are vital, because they are aimed at concrete issues and have higher impact on the target groups or area. Strategic, large-scale projects shall setup the milestone ideas, concepts or paradigms of fundamental importance for the EU. Smaller-scale, lower-budgeted projects should concentrate on practical developments and introduction of these concepts into practice (i.e. pilot, demonstration and replication projects).

The simplification of rules should always reflect the objective of the simplification. In order to raise the participation of SMEs, more attention should be paid to their real needs. This also applies for evaluation criteria and indicators of monitoring and impact. Regarding innovation the measures should be linked with economic factors, such as profit, turnover rate, or on the other hand creating of new jobs or their preservation, expansion of production etc. The research has its specific criteria and should be measured by different means depending on the type of research (curiosity-driven research, applied research). Basic research can be measured by standard indicators like number of citations in respected media (impact factor), by positions in various contests and also by number of international patents, more precisely PCTs. Applied research may be measured by number of inventions converted into commercial products or services. Evaluation methodology should be consulted with stakeholders, including civil society organisations, where appropriate.

Even if the Cohesion policy has a different objective than the FP or CIP<sup>5</sup>, the new framework should take into account the emerging scientific capacities built from Structural funds in the coming years in the regions of the new Member States (e.g. the continuation of the research potential scheme).

- **Tackling societal challenges**

The agenda driven research from idea to market should be performed in chosen areas, clearly contributing to the competitiveness of Europe. We support the science **for society** direction in the new framework, and at the same time we emphasise the need to preserve the **bottom up approach** in a continuation of the Cooperation Specific Programme. In the case of innovation, bottom-up activities foster ideas and innovativeness of participants, because they are not limited so strictly. Also, this approach contributes to better commercialisation, because the participants have day-to-day experience with market needs. Top-down programmes should draw from the experience of successfully implemented bottom-up projects.

Another outcome of the public consultation, which was done on the national level, was a considerable number of suggestions highlighting the growing importance of evidence based policy making, and the need for European support of studies leading to a policy making approach based on analyses and **foresight exercises**.

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<sup>5</sup> Detailed Czech views on CIP are in Annex 3 to this document

Raising the awareness of general public on the importance and practical impact of EU-funded research and pan-European R&D collaboration projects is a crucial point. Responsible EU leaders could consider the potential value of establishing high-profile European training courses “how to write on science and technology”. The impact of such professional training would be huge, at least in many new Member States. Involvement of citizens may be induced through systematic and consistent explanation of correlation among level of science, capability to compete and quality of life.

Activities attracting interest and involvement of public could include:

- Popularization of science through media
- Enterprise Europe Network as a intermediary between the EC and general public
- Showing the benefit from real projects (more examples of successful projects)
- Special school subjects devoted to relationship between research and innovation should be offered not only at universities but also throughout the school system generally.

- **Strengthening competitiveness**

The new strategic framework should contribute to the competitiveness of the EU, and then it must also support research driven by the needs of the European industry. Hence we recommend that the new framework should comprise activities together with the corresponding tools of the science *for competitiveness*. The new concept of innovation should be reflected within the most sub programmes of the new framework and even within the projects themselves. The innovative approach can be reflected also by the choice of evaluation criteria.

The participation and involvement of industry in the EU programmes supporting research can be, apart from the above mentioned simplification needs, generally supported by financing research projects done by research organisations for the benefit of industry, by joint initiatives between research organisations and industry, by financing demonstration and pilot activities and by various tax incentives related to research. We consider research for the benefit of SMEs, the research done by SMEs and the Joint Technology Initiatives as very good tools, which should be continued and strengthened as well as the demonstration activities in the new framework. The JTIs should be continued, taking into account the findings of the interim evaluation of this tool done under FP 7. Based on experience, the Czech Republic regards support of programmes like EUREKA and COST from the EU level to be of vital importance for the European research and innovation. Also, increased attention should be devoted to IPR acquisition conditions, number of participants in a project and projects’ terms of payment. Companies should have the right to partially influence content of the project. The intellectual property rights regarding outputs of

each project should be clarified and accessible by the companies involved. The projects' goals should have prospective commercial benefits for the companies.

Regarding the type of SMEs to be supported at EU level, start-ups and smaller, innovations pursuing companies (up to 50 employees) should be enhanced, since these companies are often considered to be the most innovative. To facilitate SME activities in the EU programmes, it is advisable to reduce time and workforce capacities needed to run the projects – by reducing paperwork particularly in application and execution phases of the projects.

As for lighter, more open and faster implementation schemes more bottom-up projects, inclusion of aspects of marketing as well as final commercialization of products, higher financial support (now in eco-innovation the EU contribution makes only 50% of eligible costs), less bureaucratic procedures and overall simplification of the approval process would be highly appreciated. A certain flexibility in terms of covered areas could be useful; with view to fast changing conditions emerging needs could be tackled in due time.

Because most of the projects carried out on EU level are based on international cooperation, it would be useful to provide a unified partner search instrument for each future CIP programme. That way companies interested in taking part in the CIP can more easily find and join a consortium preparing a project in their field of interest. This would also facilitate the entrance of new companies into the programme. Until now, in many cases experienced companies were more successful in obtaining funding which lead to a narrow portfolio of companies involved in EU level programmes.

Concerning the RSFF tool, unfortunately, the Czech Republic was not able to take large advantage of its use, as most of the organisations who could have considered a loan for the construction of research infrastructures do not have sufficient revenues to reimburse the loan in a timeframe acceptable for the EIB. The new framework could take into consideration the fact that not all Member States were able to use RSFF and CIP financial instruments (equity financing and guarantees), and try to analyse the reasons of this fact.

Whereas the results of the science for science activities are traditionally well reported in scientific literature, either on paper or by electronic tools, the science for society and the science for competitiveness should introduce tools informing on the progress achieved within them. Results and programmes should be continuously evaluated including an assessment of their impact. Such an approach should take the gender dimension into consideration in order to ensure that the impact of European policy making is gender fair.

According to a research made by the EEN in the CZ, very few project outputs of CIP and FP7 programmes are actually covered by any IPR protective measures. The reason is that the existing formal IPR procedures in EU are time-consuming,

expensive and largely complicated so that most of the SMEs tend to avoid them. Also, IPR related procedures like IPR enforcement are time and money consuming.

- **Strengthening Europe's science base and the European Research Area**

Without deepening the science base, Europe cannot meet in a long run either the requirements of the target oriented research or the industry driven research. Hence the Czech Republic supports the science *for science* activities running on the line of the European Research Council.

The CZ highly appreciates the **progress that the ERC achieved** during its short functioning. The ERC projects represent the top of global research performance. The CZ supports the raising of the budget for the ERC. The CZ also supports the ERC effort to introduce new instruments aimed at increasing application potential of results obtained in the ERC research projects. Moreover, we submit for consideration to introduce a further instrument, an "exploratory award" (EA) aimed at the preparation of the current "starting grant project". The EA should be designed exclusively for the principal investigators who intend to realize their starting grant in an abroad research institution. We believe that such an EA can bring more young talented researchers into EU and simultaneously it can contribute to better exploitation of talents from the new Member States.

Generally, there is consensus in the scientific community to allow **open access** to publication where possible, but the concern is about the funding for such arrangements.

Considering the development of **human resources for research, development and innovation**, in addition to the funding of existing schemes of Marie Curie actions, a better coordination between DG Education and Culture, and DG Research and Innovation should be established, a status of a European PhD. student defined, a new tool for the support of mobility for tertiary educated technical staff of European RIs developed. Marie Curie actions and other early-stage researchers support schemes should pay close attention to support for work-life balance and dual career partnerships in European research and innovation. A similar tool to the Marie Curie Actions could be considered for the company research to enable innovative SME-related mobility. Companies with high innovation potential can exchange their experience in performing innovation activities. Companies with high potential can exchange their experience and/or best specialists in innovation. We are aware that some of the current mechanisms under FP7 allow for the mobility of SME's in a limited scale but a larger movement of new fresh ideas and skilled people across Europe may substantially contribute to the competitiveness of the EU industry.

The **research infrastructures including e-infrastructures** (RIs) of Pan European reach and significance should be identified and a stronger mechanism of support for **operational costs** and **transnational access based on excellence** by the EC

established. The role of ESFRI, as a leading forum in the process of defining and evaluating the RIs of Pan European reach and significance should be strengthened and redefined.

Considering the **international cooperation** we believe that the strategy of the EU should vary from state to state. Such an approach could be applied even to specific activities of the ERA e.g. to human resources or research infrastructures. In this context it will be important to define who will be made responsible to speak for the European Union on different levels. The international cooperation with non-EU countries should be supported primarily by EU institutions offices located in countries of strategic interest. Such institutions should provide consistent feedback on research, development, market and processes in their region of action. Specific support schemes should be created to enable direct technological cooperation of innovative EU companies with these non-European partners. Such network of institutions offices could be complemented by already existing networks (e.g. Enterprise Europe Network operates in 48 countries).

The number of tools in the new strategic framework should not increase. New tools should be introduced with utmost caution.

- **Governance**

The European Commission should particularly ensure effective coordination between science for society activities and science for competitiveness from inception of these directions. The synergies between programmes and activities as FP7, CIP, JTI, ETPs, LIFE+, EIPs, and LLP should be investigated and established.

The Czech Republic welcomes the **governance** of the FP7 through the existence of Programme committees, and would like to continue in the same or similar way, with the influence of the Programme committee members on the choice of priorities and the direction of calls under the new strategic framework.

**CZECH POSITION WITH RESPECT TO THE THEMATIC AREAS OF THE SUCCESSOR OF THE 7<sup>TH</sup> FRAMEWORK PROGRAMME OF THE EUROPEAN COMMUNITY FOR RESEARCH, TECHNOLOGICAL DEVELOPMENT AND DEMONSTRATION ACTIVITIES, SUPPLEMENTED WITH SUGGESTIONS FOR INNOVATIVE ACTIVITIES AND COOPERATION BETWEEN THE PUBLIC AND PRIVATE SECTORS**

*From June 2010, the Ministry of Education, Youth and Sports coordinated the work of thematic groups whose task was to draw up a document that would depict the Czech Republic's priorities in research and development on the European level for the next programming period. That is, simply put, the priorities of the successor of the 7<sup>th</sup> Framework Programme of the European Community for Research, Technological Development and Demonstration Activities (7<sup>th</sup> FP), in the context of national research financing, in connection with structural fund programmes and experience with the 6<sup>th</sup> and 7<sup>th</sup> FP. Given that a tendency towards enhancing innovation activities was already clear last year, special attention was paid to innovation. The document produced by the groups was approved by the Minister of Education, Youth, and Sport (MEYS) as a background material for public discussion, which was opened at the website of the MEYS. The outcomes of the discussion have been integrated into the document and only chapters concerning priority areas are presented in the material that follows.*

**HEALTH**

The priorities are given both in the European Union and in the Czech Republic by the Research and Development Programme of the Ministry of Health (RDP III), which states the basic goals that are to be reached. The European Union's strategy in general is based on the Millennium Development Goals defined by the UN, with three of the eight basic directions concerning health (No. 4 Health of Children, No. 5 Maternal Health, and No. 6 Combating HIV/AIDS). The European Union (Health Priorities and Cohesion Policy Objectives 2014-2020) will generally focus on promoting healthcare policy, particularly in the sphere of prevention, the health of the ageing population, the introduction of effective, high-quality and safe, but also economically sustainable processes and systems, on promoting care for the health of workers, on supporting new technologies, including "e-health", and improving the accessibility of healthcare, including cooperation across existing borders. The direction of development in the Czech Republic (RDP III) corresponds to those themes to a large degree. The proposed priorities can be summarised as the following areas:

- Prevention, early diagnosis, therapy and care for child patients: Chronic and infectious childhood diseases, such as diabetes, autoimmune disorders, genetically conditioned diseases, polygenically conditioned serious childhood diseases, including neoplasms, chronic respiratory disorders, including asthma bronchiale, and disorders of the locomotory tract. The issue of integrating child patients into society following the long-term treatment of serious diseases, including the specific aspects of healthcare for former chronic child

patients. Prevention and treatment of known types of addictions, and not only to addictive substances. In the Czech Republic, these issues are studied at a number of points (e.g., Charles University, 2<sup>nd</sup> Medical Faculty; Motol Faculty Hospital; Hradec Králové Faculty Hospital; Masaryk University, Brno Faculty Hospital – DN; Medical Faculty at Palacký University – Olomouc Faculty Hospital).

- Personalisation of medicine (in prevention, diagnostics, and the optimisation of the treatment of acute and chronic diseases), focusing on children, people in their productive age, and seniors, and focusing on the different genotypes and phenotype of patients: The question of personalised medicine has recently come to the forefront of interest of people working in bio-medicine. The reason is that in a number of cases of extended therapy and the prevention of chronic disease, the usual standard diagnostic and therapeutic procedures do not sufficiently respect the individual's specific profile. The consequence of the phenomena may be insufficient treatment, or under-treatment, on one hand, and disproportionate complications caused by the treatment, on the other. Generally, it is deemed necessary to apply to the "right" individual preventive educational and pharmaceutical procedures (e.g., in the case of increased cardiovascular risks or addictions, etc.) and that the right treatment is administered to the right patient at the right time, and best if in line with current pharmaco-genetic (pharmaco-genomic) knowledge, as differences are based, among other things, on the different genetic make-up of an individual and the current phenotype of bio-transformation enzymes and the target points of the treatment effects (epigenic influence). The issue of personalised medicine is a multidisciplinary one; it is manifest in all medical specialisations where the long-term therapy of chronic diseases is used – e.g., psychiatric, neurological, and oncological, and the search for the right methods and approaches to it must be the subject of cooperation between pre-clinical and clinical research. The development of personalised medicine, including modern pharmacotherapy, is closely related to the development of molecular biological methods. The broader application of these procedures is very desirable for effective and safe treatment. The integration of these findings will contribute to, among other things, the identification of the cellular targets of medications, bio-indicators of their desirable and undesirable effects, and rational pharmacotherapy. In the Czech Republic, these issues are studied at a number of workplaces (Charles University, 1st Medical Faculty; Medical Faculty of Masaryk University, Brno Faculty Hospital; CEITEC, Prague Psychiatric Centre, Masaryk Oncological Institute, Medical Faculty of Palacký University in Olomouc, State Medical Institute).
- The issue of the prevention, timely capture, and effective therapy of hemato-oncologic and oncologic diseases: Neoplastic diseases are among the most frequent causes of death, but the mortality rate can be significantly influenced by the timely capture of the disease. Therapeutic substances directly targeted

solely on neoplastic cells are more effective and fundamentally increase the patient's quality of life.

- The issue of neurodegenerative, neuromuscular, cerebrovascular and neurological diseases in general (related to the topic “Ageing of the Population”): The incidence of neurological diseases has increased significantly in recent years and its dramatic and continuous increase in the coming decades can be predicted. There are several reasons: the ageing of the population in developed countries, the gradually improving healthcare and social care, including better availability of healthcare; infectious diseases of an unknown origin (meningitis, encephalitis); and improved informedness of the general public about neurological diseases and treatments. An immense increase in the incidence of cerebrovascular incidents resulting in movement disorders and long-term cognitive disorders, which will significantly burden healthcare and social expenditures and will certainly have other effects of a general economic nature. The main group of diseases that deserve greater attention in relation to the ageing of the population are neurodegenerative brain disorders, in particular Alzheimer's disease and other neurodegenerative disorders (as well as secondary dementia) and Parkinson's disease. Other diseases include other extra-pyramidal disorders affecting movement (“movement disorders”, such as essential tremble, dystonia), multiple sclerosis, epilepsy, traumas of the nervous systems and neuropathy and neuropathic pain. Generally, patients with movement disorders, cognitive disorders, affective and behavioural disorders, and neuropathic pain have a significantly influenced quality of life, employment, family life, and interpersonal relations. Scientific discoveries and treatment procedures leading to prevention, early diagnostics (e.g., by searching for specific markers) and, once the disease has developed, searching for specific and rational medical procedures (pharmacological but also non-pharmacological and specific surgical procedures) are an open challenge, both for researchers in neuroscience and clinical workers. The main research priorities include the search for diagnostic markers of neurodegenerative cerebral disorders, the study of other simultaneous changes in the brain participating in the development of the disease (e.g., an evaluation of inflammatory and vascular changes in the brain), and generally the study of markers for evaluating the progression of neurodegenerative disorders and the effects of treatment. These include, in particular, clinical markers, imaging, biochemical and genetic markers, as well as electro-physiologic and neuro-sonographic markers.
- Theoretical and practical approaches in the treatment of metabolic disorders and nutrition, in particular the treatment of obesity and metabolic syndrome as serious risk factors in the development of other chronic diseases (e.g., type 2 diabetes): Obesity – a serious civilisation risk factor in the development of other chronic disorders, obesity is the most frequently occurring metabolic disorder, which plagues not only adults, but increasingly also children. The

factors influencing the development of obesity and metabolic syndrome must be studied, both in the population as a whole and in individual risk groups, e.g., children with various chronic diseases.

- Prevention of cardiovascular diseases, research and application of modern methods and procedures, and the optimisation of palliative care; early diagnostics and the personalisation of cardiovascular disease treatment: Prevention must clearly dominate in cardiology, which means influencing how parents treat their children and also changing the social environment: eating habits, appropriate physical activity, drug addictions – smoking, alcohol, drugs. Another focal point of this programme must be prevention in adulthood: again, eating habits, exercise and not smoking, as well as sufficient dispensary care with the appropriate intervention activity. Another range of activities in cardiology should focus on preventing the occurrence of atrium fibrillation and chronic heart failure, which are becoming 21<sup>st</sup> century epidemics. Focusing on genetic disposition, initiating factors, lifestyle factors, and on preventing complications. Greater attention should be paid to atherosclerosis, in particular to early molecular diagnostics of its genetic causes and treatment. Transfer of knowledge about the effects of substances obtained on each level of study (in silico/in vitro/in vivo) targeted at increasing the safety of treatment and the possibility of extending the areas of indication. An aspect of equal importance in cardiology is care for the ill at the terminal stage of cardiovascular diseases, i.e., palliative care. Appropriate conditions for caring for the people thus afflicted have not yet been developed. In the sphere of the early diagnostics of cardiovascular diseases, the main issues will be the detection of new risk factors and the development of new imaging methods, including molecular imaging, that make it possible to diagnose cardiovascular diseases at very early stages and, in the optimum case, identify an occurrence before the first clinical manifestation of the disease appears. In the personalisation of care, the main issue will be the application of leading diagnostic and treatment methods that allow for highly individualised treatment. The combined outcome of improved prevention, early diagnostics, and the individualisation of treatment will be an improvement in the overall results of the treatment of CV diseases, improved quality of life, extension of the productive age, and also a better cost-benefit ratio of the treatment of CV diseases in the medium range.
- Research focused on modern procedures in treating serious conditions (polytraumas and multi-organ failure, sepsis): Polytraumas and septic conditions are presently the most frequent causes of death of patients in intensive care in developed countries. These treatments often result in the syndrome of multi-organ failure and account for a substantial part of treatment costs. A high level of mortality and subsequent morbidity remain a problem, which further increases the cost of treatment. It is therefore evident, and it is confirmed by the current direction of research, that through the mere

support of research in the early diagnostics of these conditions, and by supporting research of the effective treatment of organ dysfunction or the substitution of organ function, we can reduce the mortality in polytraumas and septic conditions, reduce the duration of hospitalisation in intensive care, and decrease the subsequent morbidity of those patients.

- Translation medicine: Research in translation medicine supports the co-operation of three key groups that form the core of modern medicine – academic workplaces, the healthcare sector, and the bio-pharmaceutical industry. Unique technologies in genomics, proteomics, metabolomics, high-capacity screening, pre-clinical development, imaging methods, and new possibilities in clinical testing with pharmacodynamic goals, give rise to the possibility of the development of new therapies and to a search for biomarkers of the diseases, which will be individual for each patient. Support for translation research in a broad medical context and across various disciplines will make it possible to translate the findings of basic research into tangible improvements in medicine. Translation biomedicine research is carried out at a high quality in the Czech Republic at many academic workplaces and in practically all university hospitals and in institutions directly managed by the Ministry.
- The issue of neoplastic diseases and the possibility of their prevention, diagnostics, and treatment: Neoplastic diseases are the second most frequent cause of death, with a dramatically increasing incidence, which is only partially due to the ageing of the population. The costs of prevention, diagnostics, and, in particular the treatment of malignant diseases grow year on year, with an uncertain vision of their long-term sustainability. Research should focus primarily on diagnosing tumours in early clinical studies, on identifying new therapeutic goals and biomarkers, genetically conditioned neoplastic diseases, the personalisation of treatment, identification of new medicines and treatment procedures, and study of less frequent neoplastic diseases. Research in this sphere should be the Czech Republic's priority, with a view to its occupation of top ranks in international statistics of the occurrence of a number of tumours, and also with a view to the existence of research conducted by Czech teams (Masaryk Oncologic Institute, 1<sup>st</sup> Medical Faculty of Charles University, Medical Faculty of Palacký University, Institute of Molecular Genetics of the Czech Academy of Science, Institute of Organic Chemistry and Biochemistry of the Czech Academy of Science, and others).
- Stem-cell research and other top-level biotechnologies (tissue engineering, xeno-transplants, etc.), iPS cells, cell reprogramming and the possibilities of their clinical use, in particular in the treatment of neurodegenerative diseases, sensual disorders, and diseases of the cardiovascular and locomotory systems. Research should also focus on genetic changes in stem cells related to ageing and therefore to prolonged exposure to mutagen factors that cause their

malignant transformation and therefore the occurrence of neoplasms, which are an increasing element of morbidity connected to the lengthening of human age. In the Czech Republic, these issues are studied primarily at the 1<sup>st</sup> and 2<sup>nd</sup> Medical Faculties of Charles University, Institute of Experimental Medicine of the Czech Academy of Science, Institute of Molecular Genetics of the Czech Academy of Science, Masaryk University Brno, and the Animal Production Research Institute.

- Reproduction ageing of the population: due to changes in lifestyle and the overall increasing of the average age of the population, people postpone reproduction to a later time. This shift leads to an increased occurrence of reproductive disorders and to changes in the quality of foetal cells. In effect, it leads to an increased use of assisted reproduction and to higher demands on techniques used in the examination of the quality of foetal cells. Research should focus on clarifying the molecular mechanisms of disorders occurring in foetal cells in relation to the increasing of the reproduction age and on improving techniques used in detecting foetal cell disorders.
- Relationship of the human organism and infectious and commensal microorganisms: resistance to antibiotics, chronic infections, immunodeficiency, chronic stimulation leading to neoplastic transformation.
- Prevention of infectious diseases in childhood and adulthood: for both age groups, infectious diseases are becoming a threat; new infections are occurring and old infections returning. There are a number of infectious diseases for which new vaccines and vaccination strategies have to be developed. In the Czech Republic, these areas are researched primarily at the State Medical Institute, at the Czech Academy of Sciences, Charles University in Prague, Hradec Králové and in Pilsen, and at university hospitals. All those institutions are involved in international cooperation, which is required for this type of research.
- Mental health of the EU population: includes research topics such as comparative studies of the occurrence of disorders in EU countries and an estimate of the need of care, a comparative analysis of systems of care for mental health (approaches to treatment, financing, approaches to evaluating efficiency), improved availability and efficiency of psychiatric care and increased quality of the life of persons with psychiatric disorders, restriction of the social marginalisation of persons with mental diseases, and neuropsychiatric disorders in old age. In the Czech Republic, these issues are studied primarily at the medical faculties of Charles University, Palacký University, and Masaryk University.
- Prevention of civilisation diseases on the basis of adverse changes in lifestyle.

## AGEING

- Biological principles of ageing (in particular on the molecular and cellular level), prevention of ageing, extension of human age.
- Changes in the nervous system related to ageing, neurodegenerative diseases, Alzheimer's disease, and other neurodegenerative diseases related to cognitive function disorders, early diagnostics of the symptoms of dementia, risk factors of the occurrence and speed of progression of diseases, treatment.
- Changes in the human locomotory system during ageing, prevention of old-age changes in the locomotory system, treatment.
- Sensory changes caused by ageing, loss of hearing and eyesight, prevention, treatment.
- Age-related behavioural changes – motivation, decision-making, attention.
- Development of joint and bone replacements, optimal environment for mobility in old-age, hearing and sight replacements, development of special technologies for seniors.
- Specific aspects of diagnosing and treating seniors' diseases with a view to the intensity and side-effects of treatment (e.g., neoplastic and cardiovascular diseases, palliative treatment, etc.)
- Looking for optimum care for seniors, individual care, institutional care, safe homes.
- Specificities of oncologic and hemato-oncologic diseases in old age, optimised pharmaco and immunotherapy, early diagnostics, genetic foundation and impact of the environment (pollutants, infections,...).
- Demographic changes in the society, social changes and the future of the ageing population, impact of demographic change on life in Europe.
- Age-based discrimination, the problem of ageism (see the European Social Survey).
- Optimisation of medical care for the ageing population, safe pharmacotherapy, specifics of the cytostatic treatment of the ageing population, institutional and community forms of care, palliative medicine.
- Ageing and public healthcare, programmes for retaining physical and mental abilities in old age, psychology of the ageing population, intra-generational relations.
- Reproduction ageing of the population, prevention of foetal cell disorders, prevention of hereditary diseases and developmental defects.

The four underlined topics are considered to be of extraordinary importance. Those topics should be considered as priority topics for discussion about research topics in

the new strategic framework. The research of ageing cannot be reduced to neurodegenerative disorders, but must also focus on preventive strategies and the systemic impacts of demographic changes.

## **THE ENERGY SECTOR**

Priorities in the energy sector can be divided into two levels – research and development activities and demonstration activities. Research and development aims at the development of new technologies, materials, and promising sectors – that is, the results of those activities are only manifest in the long-term. Demonstration activities, on the other hand, bring technologies closer to the market, allow for the pilot testing of developed technologies, and for their verification in practice.

There are four major priorities for CZ in the field of non-nuclear technologies:

- Development, increased reliability, and safety of electricity networks – the Smart Grids initiative;
- Technologies for emission-free energy generation (Clean Coal Technology);
- The development of traditional and modern electro-chemical sources of electricity; and
- The development of hydrogen technologies, including hydrogen production.

As for nuclear energy, basic research activities should focus on controlling a useable nuclear fusion. In nuclear fission, the main priorities are research, development, and demonstration activities in sustainable nuclear energy (e.g. development of the ALLEGRO high-temperature reactor, 4<sup>th</sup> generation reactors).

In addition to thematic priorities, horizontal themes must also be addressed in the energy sector:

- Targeted education and human resource development (capacity development);
- Increased participation of SMEs and industry in development and demonstration activities;
- Connecting the R&D of organisations with the private sector – taking advantage of the outcomes of research, targeting research in directions that are attractive for SMEs/industry.

**NON-NUCLEAR ENERGY** (for nuclear energy, see the chapter EURATOM)

### **Hydrogen technologies and hydrogen production**

- Hydrogen production with lower costs – R&D, demonstration projects;

- Hydrogen generation by electrolysis from the excess electrical output from the load follow of nuclear and alternative sources. High-temperature electrolysis of water, using high-potential heat – R&D, demonstration projects;
- Use of hydrogen in electricity accumulation – demonstration projects;
- Technology of producing synthetic methane and other substances suitable for use as electricity carriers - R&D.

## **Renewable sources of energy**

### **Biomass**

- Use of biomass with a high efficiency in the production of electricity, heat, and biofuels – demonstration projects;
- Biogas technology for distributed energy – demonstration projects.

### **Geothermal**

- Research of efficient use of geothermal heat for local CHS (central heat supply) systems and research of technically and financially acceptable systems for electricity generation – R&D, demonstration projects.

### **Secondary materials**

- Development of technologies for the preparation and use of SAF (solid alternative fuels) from waste for heat-plant sources of CSH – R&D, demonstration projects.

## **TRADITIONAL ENERGY – demonstration projects**

- Clean coal technologies;
- Development and use of clean coal technologies for low-energy coal – demonstration projects;
- Energy networks, including Smart Grids – R&D activities, demonstration projects;
- Development of components for energy grids, including material research;
- Development of grids (Smart Grids) and system integration that will allow highly-efficient use of the energy generated – R&D, demonstration projects;
- Application of Smart Grids in defined areas - Smart Cities, Smart Regions – demonstration projects.

## **Accumulation of energy**

- Research and development of sources of accumulation, including the integration of accumulation into concepts for local energy and heat supply systems, with the possibility of cooperation with higher-order grids and in concepts for low-energy houses – demonstration projects;
- Energy savings – R&D activities, demonstration projects;

- Development of cost-effective approaches for energy savings throughout the chain – generation, transmission, use – R&D, demonstration projects;
- The use of “traditional” electro-chemical sources (with an acidic as well as alkaline electrolyte) for short-term and long-term storage of electricity – R&D activities, demonstration projects;
- “Modern” electro-chemical sources (Li-Ion, Li-Pol, super-condensators) and their use for the accumulation of electrical energy - R&D activities, demonstration projects;
- Development of new materials and substances for “traditional” as well as “modern” electro-chemical sources with improved properties (higher density of energy, useful life, conductivity, safety) – R&D activities.

## **AGRICULTURE AND FOOD AND BIOTECHNOLOGIES**

The Czech Republic supports the relevant initiatives of Joint Programming and the creation of synergies in European agricultural research and research in the sphere of nutrition and health.

### **AGRICULTURE**

Generally, new methods and procedures to ensure the sufficient production of high-quality foods, including water, are supported by CZ, as well as the mitigation of climate change. The main research areas are:

- Research, diagnostic procedures and the prevention of the dissemination of the originators of plant diseases and pest infestations;
- Infectious diseases of farm animals, medical prevention, welfare;
- Use of biomass, by-products, and other agricultural waste products in energy generation;
- Research in the area of biotechnologies of farm animals and plants, and research of the function of genes, research of genetic sources, use of farm animals and plants in the production of recombinant proteins;
- Research and the use of plant metabolites in the production of new, biologically active compounds;
- Sustainability and quality of life in rural areas, creating new jobs;
- Sources of water and their non-agricultural use, landscape development.

### **FOODS AND THE FOOD CHAIN**

The area is an integral part of the agriculture topic (the so-called food chain “from field to fork”). Research should focus on deepening and expanding knowledge leading to the production of a broad range of high-quality and safe foods, thereby creating

the conditions for healthy nutrition for the population, and under the conditions of changing lifestyles and various civilisation phenomena. The main directions of research are:

- Food for healthy nutrition;
- Composition of food, indicators of quality, safety and authenticity;
- Modern food examination methods;
- Processing (organic) technologies and food handling.

#### **ADVANCED TECHNOLOGIES**

- Properties of hybrid and transgenic organisms, obtaining information about the role of genetic and epigenetic factors in the regulation of basic biological processes (cell differentiation, development of the individual);
- Preparation of plants with the required properties (tolerance to risk factors concerning the environment, resistance to pest infestation, specific useful properties);
- Preparation of high-performance production cell lines and organisms;
- Preparation of organisms for the biodegradation of environmental pollutants and waste from industrial production;
- Ascertaining factors that influence genome stability and the possibilities of their regulation, creation of stable genetically modified organisms (animals and plants) for agriculture and related sectors;
- Research and biotechnology of plant growth regulators for ensuring sustainable production of foods and non-food use;
- Finding new biocatalysers for chemical and pharmaceutical production;
- New production programmes using agricultural production not only in the food industry, but in particular in the chemical and pharmaceutical industry, will influence economic development and improve the competitiveness of the Czech economy;
- Development of new generations of vaccines using genetic methods.

#### **ENVIRONMENT**

In addressing environmental problems, the main goal is to support the sustainable development of society and to preserve it in all areas (the use of landscape and natural resources, protection of ecosystems and biodiversity, human environment, including cultural heritage, impact of the environment on man, agriculture, transport, the energy sector, industry, etc.).

- Protection, revitalisation, and sustainable use of resources – use of ecosystem services: comprehensive evaluation of the (long-term) impact of methods of

farming and the use of soil and water (underground as well as surface) on ecosystems and human health – using long-term data (monitoring) and historical sources (demographic, socio-economic, aerial photos, etc.).

- Protection of biodiversity and care for ecosystems – protection of the genetic variability of wild plants and animals, support for friendly farming methods that are close to nature and for non-productive functions in forests and in agriculture, reduction of the impact of farming on sources of water (quality and quantity), hydrological extremes and soil quality – sustainable farming.
- Comprehensive solution of sustainable use of landscape and revitalisation – in terms of food quality, water management, possibility for organism migration, impact of geofactors on the environment and on increasing water retention in landscape, and the protection of landscape from fragmentation.
- The impact of global changes, including climate change, prediction of impacts and adaptation measures, threats to environmental security, including economic and social aspects – modelling and prediction of the impact of the present and future situation on the basis of paleo-data, long-term monitoring of comprehensive ecosystems (LTER, BR, WFD, Natura 2000), protection of forest ecosystems, cultural soils and water management, including protection from diseases and pests. Prediction and protection from the impact of extreme meteorological phenomena and the risks for water ecosystems and farming in the countryside – floods, droughts, movement of contaminants, eutrophication. Social science research of the impact of adverse changes – mitigation and adaptation measures. Expanding the knowledge of new threats of imported germ carriers and of animal carriers of infectious diseases transferring them to man.
- Support for the development of environmental technologies for addressing problems with environmental security and the sustainable use of resources (for the issues described in points 1 to 4). This concerns primarily: waste management – its use, the protection of the atmosphere, hydrosphere, and soil from contamination, development of renewable resources, efficiency of biomass production, etc. Support should also be directed to technologies focused on chemical substance and waste management (including the mapping of contaminated areas), LCA.
- Support for the efficient monitoring of the condition of ecosystems using the European programmes LIFEWATCH, LTER-Europe, Natura 2000, Water Framework Directive and national networks such as water basin monitoring, the Elbe Project, etc. Including water (reservoirs, rivers – within basins), soil, and landscape (agricultural and forest) ecosystems, ensuring interoperability of systems and data accessibility and processing. Provide comprehensive information about the environment to public administration.

- Technologies for the protection of cultural heritage are cross-sectional and require an interdisciplinary approach (e.g., new materials and technologies, IT, natural disasters). The main direction of research are:
  - Preventive protection of cultural heritage;
  - Integration of cultural heritage into the urbanistic and natural environment;
  - Energy efficiency of historical buildings.
- Support for legislative drafting – protection of the environment, resource management, management of chemical substances and impact.
- Interconnection and sharing of data concerning the environment, its components, contamination, legislation... - creation of publicly accessible databases and information systems.

#### **INFORMATION AND COMMUNICATION TECHNOLOGIES**

Given the overlap of the needs of the Czech Republic and the priorities set out in strategic EU documents, the following key areas (challenges) have been identified for the application of the outcomes of research in ICT: e-Government, crisis management, e-Health, Ageing of the population and social inclusion, Productivity of production and services, and Knowledge, education and entertainment.

Key ICT disciplines have been defined:

- Internet and communication – Interactive digital communication, Technologies for Fixed and mobile optic networks;
- Software – Computer modelling and simulation, Processing and presentation of knowledge, Integration of knowledge, Systems in support of decision-making, Efficient development of reliable software systems with the use of components;
- Supercomputer technologies and their use in multidisciplinary modelling – Computing for Science;
- Chips, built-in computer systems and distributed systems – Telematic transport systems, Care for health and telemedicine, Coordination and cooperation in distributed systems;
- Intelligent environment and robotics – Systems with built-in intelligence, Intelligent man – machine interfaces, Computer vision and computer graphics, Industrial robotics, Intelligent machines and robots for man, Monitoring and diagnostic systems;
- Data and user security.

## **NANO-SCIENCE, NEW MATERIALS AND NEW TECHNOLOGIES**

In the current development of Framework Programmes in the area of NMP, we can point to a favourable trend in the impact of the activities of technological platforms on the contents of sub-programmes and individual calls. At the same time, we cannot overlook that there are many areas of NMP where the Czech Republic can certainly improve its success rate. To that end, a better system of more intensive communication with candidates must be sought for the successful application of calls, as well as other possibilities of support for the preparation of specific entities for such cooperation. In terms of the structure of the planned strategic framework, it would be appropriate to revise the structure of sub-programmes and the contents of NMP calls, in order to eliminate the partial fragmentation from which the priority suffers. The main criterion for the programme structure should be the possibility of setting the strictest possible criteria for assessing the quality of the proposed projects in comparison with one another (the possibility of comparing the comparable), with a minimal restriction on the contents of the planned projects by the applicants. This approach will allow for transparent decision-making in the provision of support to individual proposals and simplify administration.

NMP is a promising sub-programme of the FP, in particular in connection with its focus on the practical use of research results by industry.

## **TRANSPORT**

Strategy: The combination of knowledge with R&D capacity and their gradual integration are among the other significant results of the FP. Hence, the Czech Republic supports the continuation of the Framework Programme's programme in the theme of transport, in the same spirit with which it was implemented in the 6<sup>th</sup> and 7<sup>th</sup> FP.

For the new strategic framework, the size of budget for the given areas must be retained or even increased, with a view to the social importance of the area, which includes the significant role of the aviation industry and aviation research in the EU. Given the position and importance of air transport and its expected future development in the EU and worldwide, the Czech Republic would like to see the topic "aviation" be a separate part of the new programme.

In the Sustainable Ground Transport priority, the division of funds between Level 1<sup>1</sup> and Level 2<sup>2</sup> projects has never posed a problem. The Czech Republic therefore continues to support the balanced distribution of funds for addressing projects on Levels 1 and 2. It remains to be seen whether those levels will be defined in the new programme at all.

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<sup>1</sup> Level 1 is a general level usually concerning three modes of ground transport. Proposed projects can focus only on a specific part of a described topic or one mode of transport.

<sup>2</sup> Level 2 is a specific level and its description is clear – the goal to be achieved is described as well as the process of resolution, including the expected outcomes. On level 2, the topic must be fully covered.

For the aviation priority, however, we propose an overall review of Level 3 project tools, in order for them to become fully functional, such as are the well-established Level 1 and Level 2 project tools. Level 3 projects should have their own budget outside of the overall budget for each Framework Programme call.

In terms of project tools, the Czech Republic promotes a balanced approach in the implementation of Level 1-, Level 2-, and Level 3-type project tools in the new programme.

In addition to the clearly positive contribution of transport to the increasing of prosperity and to ensuring the mobility of EU inhabitants, the adverse impact of transport on environmental components must be studied. The Czech Republic has worked on this topic intensively and hence continues to support R&D focused on restricting the adverse impact of transport on the environment and the health of the population and fully identifies with the EU's goals in this regard.

In terms of transport infrastructure, the Czech Republic supports R&D focused on reducing energy intensity and on studying the impact of climate change on the useful life of transport infrastructure.

The Czech Republic supports R&D focused on the modernisation of vehicles for integrated transport systems that will contribute to increasing safety and the use of alternative and, in particular, renewable sources of energy, and also in relation to the increasing of travel speed and passenger comfort.

#### **ALTERNATIVE SOURCES OF ENERGY**

Czech R&D initiatives in the theme of transport concerning alternative sources of energy focus on supporting the production and use of bio-fuels and other alternative fuels, including hydrogen, on introducing vehicles using alternative fuels, and on the development of alternative drives.

The area of alternative fuels and drives is very broad and will become the subject of intensive research in the upcoming period.

The electrification of transport, including an increased share of electrical tracks in rail transport, will significantly contribute to reducing dependence of liquid oil-based motor fuels. The onset of electric car use can be expected after 2013, in particular in cities, where travel distances are shorter. After 2012, a significant onset of hybrid vehicles can be expected, combining a combustion engine and an electro-engine. The Czech Republic's activities in this regard (the ČEZ programme) are fully in line with those trends and therefore the Czech Republic fully supports programmes such as the Green Cars Initiative, which was a part of the 7<sup>th</sup> Framework Programme, and projects such as RailEnergy and FELICITAS, which were successfully addressed in the 6<sup>th</sup> FP.

#### **ROAD TRANSPORT**

The intensive use of road infrastructure brings problems to its users in the form of congestion. The use of telematic and information means will therefore play an

increasingly significant role in the upcoming period. For that reason, the Czech Republic fully supports R&D in this field.

A significant aspect of the adverse impact of transport is the high accident rate in road transport. Although a major reduction has been achieved in recent years, the present situation is not satisfactory and the Czech Republic therefore continues to support R&D in this sector, in order to achieve a 50% reduction in the number of fatalities in 2020 as compared to 2010.

### **RAIL TRANSPORT**

In rail transport, research will focus on supporting the implementation of the Technical Specifications for Interoperability (TSIs) related to the trans-European rail system and the gradual expansion of interoperability principles to regional, local, and urban public rail networks. This will cover proposed solutions of the so-called TSI open points in the ERTMS system (European Rail Traffic Management Systems) as well as research into new materials and technologies for the railway fleet, infrastructure, energy supply, IT and predictive diagnostics, with the overarching goals of reducing costs and increasing the safety of operations and passengers, i.e., to increase the attractiveness of rail transport for its customers. Another proposal for research will be to find a solution for using the Galileo system and the virtual verification of vehicles and infrastructure components and their interaction. It will also be necessary to carry on in addressing energy consumption reduction and the protection of the environment.

The Czech Republic will also participate in the preparation of the new programme in rail transport by participating in certain organisations and institutions of international organisations, such as TP ERRAC. Representatives of TP Rail Transport Interoperability participate as experts in the 7<sup>th</sup> FP ERRAC Roadmap project (European Rail Research Advisory Council, Coordinating, Creating Roadmaps, Evaluating and Prioritising Future Rail Research), whose main goals include proposing research topics in rail transport for the new programme.

For the next 10 – 15 years, the following agenda has been proposed, in line with the strategic research agenda of the ERRAC European Technological Platform:

- A price-advantageous maintenance of the railway infrastructure and a maintenance-free railway infrastructure;
- Reduction of the costs of assessing safety for railway facilities;
- Unique procedures for the testing of security equipment contributing to interoperability;
- Research into electro-magnetic compatibility.

## **COMBINED TRANSPORT**

In terms of combined transport, the Czech Republic supports its development, with the application of progressive logistical approaches.

## **AVIATION**

For the planned 8<sup>th</sup> Framework Programme, the budgets for the area need to be maintained or increased, with a view to the social importance of the aviation industry and aviation research in the EU. Given the position and importance of air carriage and its expected future development in the EU and worldwide, the Czech Republic supports the “aviation” sector again being an independent part of the new programme.

Strategic objectives in the aviation sector focus on the following main areas:

- Enhanced support by the Commission for General Aviation, Business Aviation, and regional air transport;
- Ensuring sufficient support by the Commission for the development of international cooperation with key players in European aviation;
- Enhancing the perception of aviation as a comprehensive transport system that includes both its own means of carriage and the ground infrastructure and related services that enable air carriage to function.

The future programme and its work programmes should include, according to the Czech Republic, the following research areas in aviation:

- Flight Physics;
- Aerostructures;
- Aircraft Avionics, Systems and Equipment;
- Propulsion;
- Flight Mechanics;
- Integrated Design and Validation;
- Air Traffic Management.
- Improving the Cost Efficiency of the Air Transport System;
- Efficient Manufacturing Technologies;
- Noise Abatement;
- Safety and Reliability.

## **AEROSPACE**

EU Framework Programmes with the European Commission’s financial support are very important for the domestic as well as European aerospace industry. Aerospace research cannot be efficiently carried out without international cooperation and

without integration into European research structures. Framework Programmes support national development and international cooperation, help make research activities more efficient, and in a way harmonise the national approaches of the individual EU Member States to R&D.

Given the importance and increasing interest in space research and astronautics and their expected development of the EU and worldwide, the topic “astronautics” should be an independent part of the new strategic framework, with a slightly increased budget for specific areas.

Strategic goals in the new programming period:

- Development and use of space applications serving the objectives of European public policy and the needs of European companies and inhabitants, including environmental needs and the needs of development and global climate change;
- Develop natural sciences such as physics, chemistry, biology, astronomy and medicine by supporting research in aerospace and during space flights, which will allow for the obtaining of new findings and for increasing the knowledge level of Czech scientific research; support research and development in technical sciences, such as material engineering, nano-technologies, optics, thermodynamics, energy sources, electronics, and radio-technology, which bring the adoption of new technologies and methods that are usable in industrial practice;
- Create the conditions for the development of international cooperation by supporting networking and joint research and development teams, with the involvement of leading Czech and foreign research facilities.

The above-mentioned activities should be reflected in research in specific areas:

- Design and development of satellite experiments for researching the Sun and space weather, and for researching the properties of the ionosphere and magnetosphere of the Earth and other celestial bodies in the solar system;
- Development of methods and experiments for research into the biological and chemical composition of celestial bodies, in particular the Moon and Mars;
- Development of methods for studying the climatic parameters of the environment of the Earth (atmosphere, hydrosphere) using satellite systems;
- Development of methods and experimental equipment for research into material properties, focusing on compact substances and substances sensitive to electro-magnetic radiation;
- Development of a measuring methodology and research concerning detectors of elementary particles;

- Development of measuring methods, data processing and the creation of theoretical models of high-energy radiation, in relation to international programmes;
- Development of new methods and procedures allowing for the preparation of space crews for inter-planetary flights and for the prevention of health complications related to long-term weightlessness.

To support scientific research, it is also important to develop the conditions for technical development in terms of equipment engineering, which includes:

- New procedures for the designing and completing of electronic circuits, in particular with a view to their miniaturisation;
- Development of optic materials and their processing, with high demands in terms of precision;
- Development of highly precise and sensitive antenna systems working in gigahertz frequencies;
- Development of chemical processes leading to the creation of substances with new energy, heat, mechanical, and electric properties;
- Development of intelligent automated systems with an emphasis on reducing demands on their human operation.

Like other areas, astronautics is an area of computer equipment development, of digital data processing methods, including visualisation and the three-dimensional simulation of the phenomena observed. Furthermore, on top of the areas mentioned above, we recommend a horizontal focus of the new FP in its calls, with an emphasis on:

- Critical (i.e., key) technologies;
- Strategic connection with the sphere of defence and security;
- Support of GMES and GNSS applications.

## **SECURITY RESEARCH**

Since the beginning of the 21<sup>st</sup> century, the Czech Republic has been confronted by new security threats – international terrorism, organised crime, the potential proliferation of weapons of mass destruction, regional conflicts, information security threats, financial market vulnerability, and others. The scope of such threats can be expected to increase with the increasing interconnectedness of the world. That is why it is necessary to initiate and support an extended concept of security as an integral part of human life and social development. The current rather organisational and technical approach to the development of security measures must be expanded with a systemic concept of security that will include socio-economic and cultural aspects. Therefore, areas focused on the development of methodologies, procedures, and security systems should be strengthened, as even the best technologies and

abilities can fail if the system of security risk prevention and elimination is not set in a suitable fashion. These systemic matters, including the active involvement of inhabitants and society in the ensuring of security, are also a sphere suitable for international cooperation in R&D and for joint projects that can be addressed on an international level in the successor to the 7<sup>th</sup> FP.

European security research priorities have been outlined by ESRI, which, in 2009, presented the European Security Research Agenda (ESRIA) for the next 20 years. ESRI sets the following 8 thematic areas in security research: security of inhabitants, security of critical infrastructures, security of borders, crisis management, outlooks and scenarios, CBRN security, situation preparedness and the role of aerospace, and the identification of people and property.

In terms of the general requirements for security research, it is clear that the areas defined in the European Security Research Agenda are significant for increasing security. In relation to the shifting of security research capacity in the Czech Republic and the needs of state administration in this area, areas have been identified which should be emphasised in the preparation of a new programme:

- Protection of inhabitants from terrorism and organised crime;
- Security of environmental services;
- Cybernetic security;
- Energy infrastructure security;
- Crisis infrastructure security in relation to persistent organic pollutants;
- ICT for crisis management, integrated rescue systems, and the identification of people (forensic genetics);
- CBRN security;
- Integrated rescue systems;
- Identification of people and property (biometric identification) (while respecting ethical principles);
- Outlooks and scenarios;
- Protection of the perimeter (border security is not one of our key priorities, but in a broader context, we see it as protection for facilities, buildings, and other areas).

#### **SOCIAL SCIENCES AND HUMANITIES**

- To finance key top-level databases and infrastructures serving for collecting high-quality internationally comparable data or ensuring access to existing data essential for conducting high-quality European SSH research.

- Inclusion of research topics supporting the cooperation of SSH and exact disciplines – an inter-disciplinary approach, which is the “trademark” of the FP, should be extended to exact disciplines.
- To promote small cooperation projects, which are more flexible than large projects and enable the integration of a large number of partners in the priorities, whose greater number also makes it possible to avoid the trap of a one-sided focus.
- To include in projects an analysis of the specific conditions arising from cultural history and tradition that are of fundamental importance in the application of the policies, mechanism, and strategies developed by the projects.
- Research and the development of the possibilities concerning effective access to extensive public SSH databases through Open Access; if the databases are confidential, use and make accessible mathematical models.
- Include in the main supported research topics the identification, analysis, and comparison of the compatibility, methodological relevance, and efficiency of diagnostic tools and intervention approaches and techniques in relation to persons with special educational needs and with medical handicaps from the globalisation point of view.
- To focus the programme’s strategy more specifically and more meaningfully on the research and comparison of institutional curricular policy in educational institutions in EU countries, including an evaluation of the general inclusive approach and consequences of the implementation of an equal opportunities policy, in the context of enhancing professional competence and social and professional inclusion.
- Focus research on identifying the main causes of, and analysing the main strategic tools for the elimination or inhibition of, the increasingly alarming state of interest in educational disciplines and professions focused on natural sciences across university educational systems in EU countries, in cooperation with primary and secondary-level educational institutions.

#### Topics identified:

- Methods for obtaining knowledge from data and their use in economic decision-making;
- Multidisciplinary support for management decision-making in a knowledge society;
- Public finance deficits – a threat for the upcoming decades;
- A common currency policy – an obstacle or incentive for the dynamic development of the economies of EU countries;

- Ageing of the population and life-cycle changes – consequences for age identity, the labour market, healthcare and social policy, and inter-generational communication;
- The economic and social sustainability of measures aimed at CO<sub>2</sub> emission reduction in the light of unforeseeable climate change;
- Ethical issues in biotechnological research, medicine, and healthcare policy (stem-cell research, work with information, risks of the occurrence of pandemics vs. the costs expended on their prevention and combat, etc.);
- National and linguistic identity, European identity, migration, immigration, and integration;
- Linguistic rationalisation in the European Union – teaching languages, teaching in foreign languages, obstacles and inequalities in language knowledge, linguistic rationalisation infrastructure;
- The quality, flexibility, universality and specificity of pedagogical competence in the educational system as the primary determining factors of the quality of preparation for professional and social inclusion in EU countries;
- The identification of the continuity, stability, and integrity of educational systems in a united Europe, and the identification of the evaluation of elements of exclusivity with respect to non-European systems, based on their historically enhanced tradition;
- Elements of emancipation and mobility in undergraduate, post-graduate, and life-long university education within the EU and its impact on changes in the pedagogical approach of academic workers and teaching methods, and in the internal management and modernisation of universities in direct contact with the consumer sphere;
- Changes in human behaviour in terms of the change of values, development of new habits, and ways of thinking due to new technologies;
- The consequences of media channel homogenisation, easier communication, new illiteracy;
- The social and cultural context of identity formation with a view to the regulation of the behaviour of entities (individuals, groups, organisations);
- Key well-being factors in the European context – general characteristics and specificities in individual countries;
- Prevention of civilisation diseases on the basis of changes in lifestyle;
- Economic research – preventing economic crises, creating development scenarios, political impact of project results; emphasis on research topics that support the transfer of knowledge from natural and technical sciences to economics (econophysics);

- Knowledge society – education, knowledge and gender, expert knowledge in everyday life;
- Gender equality issues – new forms of family / partner cohabitation, gender and the labour market;
- Governance and citizenship – citizen participation;
- Labour market – flexibility and uncertainty.

## **EURATOM – NUCLEAR RESEARCH**

### **FUSION – R&D ACTIVITIES**

- Participation in international efforts to prepare a use for nuclear fusion, focusing on the development of basic physical findings and activities related to ITER, HiPER – R&D.

### **FISSION – R&D ACTIVITIES, DEMONSTRATION PROJECTS**

- Safety, useful life, management of fuel and waste;
- Development towards increasing the safety of the current reactor generation and their greater efficiency and useful life, together with improving the ways of managing nuclear fuel and waste and depositing waste in short-term and long-term stores – R&D, demonstration projects,
- Sustainable nuclear energy;
- Research and development of 4<sup>th</sup> generation reactors – R&D;
- Efficient use of nuclear fuel and minimisation of waste – R&D;
- Research and development of an ALLEGRO gas-cooled high-temperature reactor – R&D, demonstration projects.

### **INTERDISCIPLINARY TOPICS – R&D ACTIVITIES**

- Radiation protection and impact of ionising radiation on health / environment;
- Research into the impact of low doses of ionising radiation on human health and the environment – R&D,
- Use of ionising radiation in medicine;
- Research in this area, focusing on radiopharmaceuticals, equipment, and methods of use – R&D.

## **STRATEGIC INDUSTRIES**

The absence of a topic for strategic industrial disciplines has been one of the causes of the low rate of success of projects focused on innovations in industry and hence the low motivation of Czech and other entities to submit projects with that focus. The inclusion of a topic focused on supporting strategic industrial disciplines would be of great assistance to all European industry in the implementation of innovations with a

high added value, and thereby also to a rapid improvement of European competitiveness.

#### **EUROPEAN RESEARCH COUNCIL**

The autonomy of the ERC must be enhanced on the European level (in particular, this means the development of rules suitable for frontier research, which in many regards differs from research motivated by the needs of society, to which most of the Framework Programme budget is dedicated), with a simultaneous significant increase of its budget, because only then can the ERC meet the demands of frontier research, thereby significantly contributing to the maintenance and enhancement of the competitiveness of the entire ERA, on the worldwide scale. Hence, in spite of the differences in the ERC success rate between old and new EU Member States, the uncompromised emphasis of the ERC on the excellence of ERC grant recipients must be supported.

The Commission should commission an analysis of the significant differences in the success rate of countries in the specific programme Ideas, in particular in comparison with the new EU Member States (EU-12). It is also important to coordinate the ERC's work with other community programmes for the development of human resources in R&D, in particular with the specific programme "People" of the 7<sup>th</sup> FP (Marie Curie Action, MCA), such as to achieve the desirable synergies. It would also be necessary to get away from the subsidy system based on a structured budget, transferring to the system of "flat amounts" or total "price" of a project, and to restrict the current extended stay of certain projects on the back-up list.

The European Commission should strive for maximum transparency and the optimal flow of information towards Member States and the public at large, both by the timely publication of information in databases (CIRCA, E-CORDA) and by the provision of information about the membership of evaluation panels. The possibility of suggesting leading experts for the evaluation panels on the national level should be introduced, while maintaining a reasonable level of balance in the representation of the Member States. Given the overall low success rate of the ERC and the minimal representation of Czech experts in international ERC evaluation panels, the greatest possible number of leading Czech scientists would be involved in the project evaluation process, in order that know-how could be transferred in terms of the financing environment of top-level European research. A possible solution is the creation of a central database of experts for expert evaluation administered by the Ministry of Education, in which experts would be included on the basis of the recommendation of selected institutions, such as the Czech Academy of Science, Charles University, or the Czech Rectors' Conference. The administrator of that database would closely cooperate with the standing ERC committee that would develop an international database of experts in cooperation with the scientific council.

Success in competition for ERC grants is undoubtedly one of the most important indicators of the quality of a research institution. A significant increase in the success rate of Czech applicants and the attractiveness of Czech host institutions must therefore be supported and international standards must be followed in the evaluation of institutions and individuals, international peer review must be used more intensively in the evaluation of national projects, and competitiveness of Czech science must be purposefully developed by supporting research institutions that are excellent according to worldwide standards and in relevant scientific disciplines.

Czech universities and research institutions should be more open to the international environment and be active in looking for new, primarily young talents, and motivate their existing excellent researchers to further professional growth and provide them with an appropriate environment and the maximum possible support. This strategy will manifest itself in the longer term in a higher success rate in winning ERC grants.

## **HUMAN RESOURCES**

The specific programme “People” is an effective tool for supporting researchers mobility and professional growth – it must be further developed and supported in the new programme.

The specific programme “People” should continue to cover all thematic areas without limitation (“bottom-up”) and all areas of the scientific career of researchers (from training networks for starting research workers, support for the professional growth of experienced research workers, to reintegration grants).

There is no systemic support for the growth of highly qualified scientific and technical workers (university-educated technical-operations workers) who technically ensure the functioning of individual research infrastructure, enable the work of, and/or constitute a part of, excellent research teams. That is why we propose creating new tools for supporting the mobility of those research and technical workers for European research infrastructures. Given the significance of training networks (ITN) for the education and circulation of brains within the ERA and the frequency of the use of this action in the specific programme “People”, it is necessary to increase the budget set aside for projects of this type. Given that the MCA now falls within the competence of DG Education and Culture, it is necessary to ensure complementarities with Community programmes for the development of human resources in R&D, and the goals of the specific programme “People” (the Marie Curie Action, MCA) must be structured such as to achieve the requisite synergies. At the same time, the steps of DG Research and DG Education and Culture must be coordinated and the status of doctoral students must be defined on the European level.

The COFUND scheme should continue, serving national, regional, and institutional schemes of scientific mobility.

The new programme should also include gender aspects of academic careers development in its policies and tools. Supporting women in science is necessary for

the development of science, research, and innovation and also for ensuring the equality of opportunities in the scientific environment. More than 50% of women study at universities in the Czech Republic, but few of them go on to do their doctorate and on to research. The EU needs male and female scientific workers for increasing its competitiveness, which is why it cannot afford to lose the high potential of qualified women. The development of new measures to develop the possibilities of career application for women in science, in particular, at the start of their career, and also with a view to the representation of women in decision-making, represents social innovation.

## **INTERNATIONAL COOPERATION**

With a view to a change in the programme structure between the 6<sup>th</sup> and 7<sup>th</sup> FP, it can be expected that in the new programme, too, there will be an opportunity to submit projects of international cooperation according to the priorities defined in specific thematic groups (Health, Agriculture, Environment, etc.). International cooperation as such continues to be reserved for institutional cooperation and coordination in which primarily national providers and research and development programme administrators can participate. The specific focus of cooperation will then be determined in line with the Commission's political goals, such as the Europe 2020 strategy, the Innovative Union initiative, and the results of the discussions at the **Strategic Forum** for International Scientific and Technological Cooperation (SFIC). If the categories of SIC projects are retained in the proposal of the new programme, under which specific scientific projects will run, then support for general programmes concerned with institutional cooperation with third countries will likely continue to be outside of the scope of interest of most research institutions in the Czech Republic.

It remains to be considered whether the Czech Republic should specify medium and long-term concepts for the direction of international cooperation in research and development with a view to the priorities of EU Framework Programmes, such that these mechanisms could also be used for the benefit of research in the Czech Republic.

## **RESEARCH INFRASTRUCTURES**

Priorities:

- CZ supports the continuation of the Research Infrastructure programme, in particular the scheme of integration activities from the 7<sup>th</sup> FP (projects such as I3 in the 6<sup>th</sup> FP) and an increase of its budget;
- In connection with research infrastructure, the retention of other framework programme tools – in particular support for excellent research based on cooperation, support for individual excellence, mobility, and career development, the development policies of the European Research Area, as well as specifically of tools for supporting the access of small and medium-

sized enterprises to the results of R&D and supplementary schemes, such as joint programming and projects such as ERA-NET; (in connection with the previous point) is important;

- Financing the scheme of transnational access to research infrastructures with a European dimension. The financing of “open access” from European resources, for projects from the ESFRI road map, will contribute to the sustainability of infrastructure projects;
- Drawing up an overview of national research infrastructure with a European dimension in the ESFRI; (in connection with the previous point);
- Financing the operational costs of ESFRI infrastructures in social sciences and humanities;
- Retaining support for the preparatory phase of the newly identified research infrastructures; support design studies of other pan-European research infrastructure, even outside of the ESFRI road map, in cases when there is a critical need and clear European added value;
- Financing the strategy for the building and development of large infrastructures in cooperation with non-EU countries (USA, Japan, Asia, and others) in connection with the need to look for interdisciplinary solutions to global challenges, securing financial and human resources and innovation opportunities;
- Enhancing international cooperation in large infrastructures in coordination with the activities of the ESFRI and the Scientific Forum for International Cooperation (SFIC); (in connection with the previous point);
- Introduction of systemic solutions for human resources involved in research infrastructures, which will include:
  - A scheme for supporting the growth and mobility of highly qualified scientific – operational – technical workers who technically ensure the functioning of unique research infrastructures, enable their functioning, and/or are members of excellent research teams;
  - A scheme for supporting and coordinating senior management workers in research infrastructures;
  - Improvement of the quality of joint human resource management (e.g., the Steering Group on Human Resources and Mobility) and examination of the possibilities of developing specific coordination activities, such as the establishment of the European Association for Human Resource Development for Research Infrastructures; (in connection with the previous point);

- Synergies with cohesion policy, structural funds, Framework Programmes, and the CIP programme, in particular in the preparation and construction of new pan-European research infrastructures;
- The execution of administrative measures in support of and for the development of SMEs. In this context, it is recommended that synergies with the CIP programme be examined.

#### **REGIONAL ASPECTS OF THE STRATEGIC FRAMEWORK**

The new programme should not neglect the regional dimension, which is supported in the 7<sup>th</sup> FP in the activities Regions of Knowledge and Research Potential. In particular, projects such as Research Potential represent an interesting opportunity for projects from structural funds (OP RDI), in terms of better integration in the European Research Area. Furthermore, due to their financial size, they can significantly support the sustainability of these projects.

#### **INNOVATION AND PUBLIC AND PRIVATE SECTOR PARTNERSHIPS**

Small and medium-sized enterprise would develop measures in the following areas for the development of their innovation activities:

- In terms of legislation, they consider the most suitable form of support to be a reduction of the tax burden and an increase in permitted deductible expenditure on R&D;
- In the administration of programmes, there is a requirement for maximum simplification of procedures and rules, and for the harmonisation of rules in various programmes;
- Access to financing for R&D&I must be facilitated (European and national programmes, venture capital, bank instruments), and companies also prefer contractual and flat-rate contributions to cost-based ones;
- In cooperation with universities and research institutes, companies would welcome greater flexibility from those organisations;
- In the new programme, Czech companies would welcome a greater scope of demonstration activities.

#### **INNOVATION AND COOPERATION OF THE RESEARCH AND INDUSTRIAL SECTOR**

Priorities:

- Support R&D projects which efficiently stimulate the cooperation of the public and corporate sectors in R&D&I, and whose focus and goals cover the entire innovation cycle; create programmes for supporting projects with a higher socioeconomic impact, where a transfer of knowledge into practice and its placement on the market will be consistently required (and supported).

- Carry on in supporting the schemes of the 7<sup>th</sup> FP, such as “Research for SMEs” and “Research for SME Associations” in the new programme as well, so that:
  - A more significant part of the budget (approx. ¾) should be devoted to “Research for SMEs” and ¼ of the budget to “Research for SME Associations”; where demonstration activities are a part of each project;
  - A programme for supporting the introduction of innovation in SMEs would not be used for addressing the plans of research organisations (for research organisations, participation in this type of project is attractive from the financial point of view, as their costs are fully paid in the present situation; on the contrary, due to the asymmetrical distribution of the Commission’s contribution, these projects represent a considerable financial burden for SMEs).
- Ensure the continuation of schemes focused on supporting the participation of research-oriented SMEs, which use national financing (EUROSTARS, EUREKA), while maintaining the thematic freedom in this scheme (bottom–up).
- Acceleration of selection procedures by means of single-level evaluation in both project types.
- Increase emphasis on the greater market application of research results; increase emphasis on demonstration (pilot) activities prior to project completion.
- Support the continuation of PPP activities (in spite of the relatively scarce European experience with PPP in R&D&I) and the harmonisation of the rules of PPP projects with standard projects in the future Framework Programme, which is required for simplifying participation in these projects.
- In the case of projects focused on innovation, transfer from financing based on costs to financing based on results, i.e., transfer to the financing of research projects on a principle similar to that according to which public contracts are chosen and awarded, i.e., selection of project proposals by public competition and the implementation of the research project on the basis of a contract concluded by the Commission and the researcher for a contractual price agreed in advance; the use of flat-rate contributions by the Commission to the maximum extent possible.
- Create a platform of support for small and medium-sized enterprises, where EU funds would be allocated directly on the regional level (NUTS II).

## Overview of the Members of Thematic Working Groups

<b>Health</b>	
Václav Hampl – Chairman during the first half of the work	Charles University Prague
Pavel Anzenbacher – PV <sup>3</sup>	Palacký University Olomouc, Institute of Pharmacology
Judita Kinkorová – NCP <sup>4</sup>	Technological Centre of the Academy of Sciences of the Czech Republic ( <b>TC AS CR</b> )
Eva Syková	Institute of Experimental Medicine of the Academy of Sciences of the CR ( <b>AS CR</b> )
Jaroslav Štěřba - Chairman during the second half of the work	Masaryk University Brno - Medical Faculty
Marek Moša	SEVAPHARMA Inc.
Lenka Moravcová	Ministry of Health
<b>Ageing of the Population</b>	
Josef Syka – Chairman	Institute of Experimental Medicine of the AS CR Sciences
Pavel Anzenbacher – PV	Palacký University Olomouc, Institute of Pharmacology
Judita Kinkorová – NCP	TC AS CR
Ladislav Rabušic – PV	Masaryk University Brno, Faculty of Social Studies
Michal Pacvoň – NCP	TC AS CR
Marek Blatný	Institute of Psychology of the AS CR
Eva Topinková	Charles University – 1 <sup>st</sup> Medical Faculty
Petr Wija	Ministry of Labour and Social Affairs
<b>Energy Sector, including EURATOM</b>	
Zdeněk Stuchlík - Chairman	Silesian University Opava
František Hrdlička - PV	Czech Technical University Prague
Pavel Pavlo – PV	Institute of Plasma Physics of the AS CR
Milan Tichý – PV	Charles University Prague - Math and Physics Faculty
Ivo Váša – PV	Nuclear Research Institute, Řež
Ladislav Musílek - PV	Czech Technical University Prague
Zdeňka Šustáková - NCP	TC AS CR
Jiří Pospíšil	Brno University of Technology
Vladimír Wágner	Nuclear Physics Institute of the AS CR
Aleš Laciok	CEZ - R&D Coordinator
Luděk Janík	Nuclear Research Institute, Řež
<b>Environment – Including healthy nutrition, agriculture</b>	
Nada Koníčková - Chair	TC AS CR
Bořivoj Šarapatka - PV	Palacký University Olomouc
Jana Hajšlová – PV	Institute of Chemical Technology Prague

<sup>3</sup> PV – Member of the 7<sup>th</sup> FP Programming Committee

<sup>4</sup> NCP – National Contact Point for the 7<sup>th</sup> FP

Zdenka Šustáková - NCP	TC AS CR
Viera Straškrábová	BC of the Czech AS CR – Hydro biological Institute
Bedřich Moldan	Charles University Prague – Charles University Environment Centre
Jan Frouz	Charles University Prague. Faculty of Science
Zuzana Boukalová	Vodní zdroje Inc.
Miloš Drdácký	Institute of Theoretical and Applied Mechanics of the AS CR
Ladislav Jeřábek	Ministry of Agriculture
Miroslav Koberna	Director of the Federation of Food and Drink Industries of the Czech Republic
Jana Klánová	Masaryk University Brno
Ladislav Steinhauser	University of Veterinary and Pharmaceutical Sciences Brno

### ICT

Michal Pazour - Chair	TC AS CR
Jiří Kadlec – PV	Institute of Information Theory and Automation of the AS CR
Eva Hillerová - NCP	TC AS CR
Július Štuller	Institute of Computer Science of the AS CR
Vladimír Mařík	Czech Technical University, FEL
Ota Novotný	University of Economics, FIS
Martin Fařun	TC AS CR
Václav Jirovský	Czech Technical University Prague
Jiří Voříšek	Czech Society for Systems Integration

### Social Sciences

Michal Pacvoň - Chairman and NCP	TC AS CR
Ladislav Rabušic - PV	Masaryk University Brno – FSS
Klára Plecítá	Institute of Sociology of the AS CR
Pavel Pudil	University of Economics Prague

### ERC

Jan Hrušák - Chair	AS CR
Petra Perutková - NCP	TC AS CR
Jaroslav Koča – PV	Masaryk University Brno – CEITEC
Zdeněk Strakoš	Institute of Computer Science of the AS CR and the Math and Physics Faculty of Charles University Prague

### Human Resources in Research

Táňa Perglová – Chair during the first half of the work	Ministry of Education, Youth, and Sport
Jiřina Fryčová – SGHRM	Ministry of Education, Youth, and Sport
Petra Perutková –NCP	TC AS CR
Tomáš Kostelecký	Institute of Sociology of the AS CR
Anna Mittnerová - PV	Institute of Chemical Technology Prague
Jana Hakenová	Ministry of Education, Youth, and Sport

Viktoria Bodnárová	Czech Centre for Mobility EURAXESS
Jaroslav Jakubka	Ministry of Labour and Social Affairs – employment legislation
Zdeněk Přeslička	Ministry of Labour and Social Affairs – sickness and accident insurance
Andrea Veselá	Ministry of Labour and Social Affairs – migration
Libuše Chládková	South-Moravian Centre for International Mobility
<b>Research Infrastructures</b>	
Vladimír Nekvasil – Chairman	Institute of Physics of the AS CR
Jan Palouš – PV	AS CR
Lenka Havlíčková – NCP	TC AS CR
Naděžda Witzanyová – ESFRI	Ministry of Education, Youth, and Sport
Gabriela Vlčková – structural funds	Ministry of Education, Youth, and Sport
Josef Krása	Institute of Physics of the AS CR
Vojtěch Petráček	Czech Technical University Prague
<b>International Cooperation</b>	
Libor Daněk - Chair	Ministry of Education, Youth, and Sport
Michal Pacvoň – NCP	TC AS CR
Jan Šafanda	Institute of Geophysics of the AS CR
Jaromír Plášek	Charles University Prague - Math and Physics Faculty
<b>New Technologies, New materials</b>	
Ivan Wilhelm – Chairman	Government Commissioner for European Research
Karel Šperlink – PV	Association of Innovative Entrepreneurship CR, Confederation of Industry of the CR
Gabriela Zdražilová –NCP	TC AS CR
Pavel Chráska	Institute of Plasma Physics of the AS CR
Karel Bouzek	Institute of Chemical Technology Prague
Vilém Růžička	Elmarco - nano for life
Miloš Beran	Atok
David Lukáš	Liberec Technical University
<b>Innovation, including the approach of the Czech Republic to PPP partnerships</b>	
Karel Klusáček – Chair	Technological Agency of the Czech Republic
Petr Porák – PV	Ministry of Industry and Trade
Martin Škarka – NCP	TC AS CR
Lenka Havlíčková - NCP	TC AS CR
Karel Aim	Institute of Chemical Process Fundamentals of the Academy of Sciences
Petr Klement	VŠB - Technical University of Ostrava
Pavel Bartoš	FITE Inc.
Dana Váchová	TC AS CR
Karel Šperlink - PV	Confederation of Industry of the Czech Republic, Association of Innovative Entrepreneurship CR
Mirek Janeček	Association of Research Organizations
Zdeněk Kučera	TC AS CR

Tomáš Skuček -CIP5	Ministry of Industry and Trade
<b>Space and Transport</b>	
Jana Bystřická - Chair	Ministry of Education, Youth and Sports
Jan Kolář - PV	Czech Space Office
Ondřej Mirovský - NCP	TC AS CR
Petr Heinzl	Astronomical Institute of the AS CR
Zdeněk Němeček	Charles University Prague –Math and Physics Faculty
Václav Fencel -PV	Transport Research Centre Brno
Martin Škarka - NCP	TC AS CR
Karel Paiger	Aeronautical Research and Test Institute Inc.
<b>Security</b>	
Michal Pazour – Chair	TC AS CR
Pavel Danihelka	VŠB - Technical University of Ostrava
Blahoslav Dolejší	Ministry of Defence
Eva Hillerová	TC AS CR
Richard Hlavatý	Defence and Security Industry Association of the Czech Republic
Milan Holl	Association of Research Organizations
Václav Jirovský	Czech Technical University Prague
Helena Tomková	Ministry of Interior
Jarmil Valášek	Ministry of Interior - Population Protection Institute
Jan Vykoukal	Ministry of Interior
<b>Coordination, implementation, redaction</b>	
Naděžda Witzanyová	Ministry of Education, Youth and Sports
Lenka Havlíčková	TC AS CR
Nad'a Koníčková	TC AS CR

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<sup>5</sup> Gestor for Competitiveness and Innovation Framework Programme

## **POSITION OF THE CZECH REPUBLIC ON DOCUMENT COM(2011) 174 final**

### **“THREE MEASURES FOR SIMPLIFYING THE IMPLEMENTATION”**

*April 2011*

#### **Introduction**

In September 2010 the the position of the Czech Republic “SIMPLIFYING THE IMPLEMENTATION OF THE RESEARCH FRAMEWORK PROGRAMMES” has been prepared by a working body of the Ministry of Education, Youth and Sports of the CZ (MoEYS). This document is part of this Annex and reflects the new development concerning the issue of simplification, concretly introduction of “three measures for simplifying” introduced by the document C (2011) 174 final.

The following text describes the position of the CZ on the three measures:

#### **AVERAGE PERSONNEL COSTS**

The CZ appreciates the effort of the European Commission (EC) to simplify the rules concerning usage of average personnel costs in FP7. In the past, most organizations in the CZ have not submit request on the certificat to the EC and thus have not used average personnel costs in FP7 projects. However, it seems, that the new simplification in this area may motivate more Czech organizations to use average personnel costs in FP7 projects. Consequently, CZ would appreciate more clear interpretation of the newly applied principles to avoid further different interpretations by different auditors – i.e. especially the Article 4 *“Personnel costs charged on the basis of methodologies ... shall be deemed not to differ significantly from actual costs.”*.

#### **FLAT-RATE FINANCING OF SME OWNERS AND OTHER NATURAL PERSONS NOT RECEIVING A SALARY**

The CZ highly welcommes and supports the use of flat-rate financiing for natural persons and SME owners who do not receive a salary. It fully reflects the Czech position publised in September 2010 (VERA\_12\_2010). Additionally, the CZ would apprecciate more clear interpretation form the EC of some aspects concerning the usage of this flat rate – i.e. especially the definition and necesseary supporting evidence for defining different research categories (i.e. full time experience in reserch).

#### **RESEARCH CLEARING COMMITTEE**

The CZ highly welcommes and supports the activity to set up a Research Clearing Committee between the Directorates-General responsible for the implementation of indirect actions under the FP7. The CZ support that it will lead to the uniform interpretation of FP7 rules and principles across all Directorates General

and by all project officials. It fully reflects the Czech position published in September 2010. Additionally, the CZ would appreciate more information concerning the practical issues of cooperation of this body with the Member States (represented by e.g. National Contact Points for FP7).

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**POSITION OF THE CZECH REPUBLIC ON DOCUMENT COM (2010) 187  
“SIMPLIFYING THE IMPLEMENTATION OF THE RESEARCH FRAMEWORK  
PROGRAMMES”**

***September 2010***

**Introduction**

Over the past decades the Czech Republic (CZ) has been gradually involved in Framework Programmes (FPs), at first as a third country in FP3 and FP4, subsequently as an associated country in FP5 and only in 2004 as an EU Member State. Member organisations have gradually improved their knowledge of financial, administrative and legal rules of FP projects and try to better understand the complexity and development of those rules when submitting and managing projects. The fact that FP rules are new for a number of organisations (i.e. different from national programmes) may result in their fear to participate in FPs due to extensive administration related to the preparation and implementation of projects and ambiguous understanding of rules, which may lead to erroneous implementation and subsequent findings in financial audits. This raises a question whether demanding projects are indeed delivered by the most competent teams or whether they are delivered by teams that have better knowledge of the robust rules of the programmes.

Thus, the CZ highly appreciates efforts of the European Commission (EC) to simplify the rules of Framework Programmes, to achieve their stability and uniform interpretation as well as to discuss the move from cost-based funding towards result-based funding.

The position of the CZ has been prepared by a working body of the Ministry of Education, Youth and Sports of the CZ (MoEYS), namely by the Committee for the European Research Area (VERA), based on experience of selected experts with FP implementation and experience of national contact officials with FP7.

### **Stable, uniformly interpreted and harmonised rules**

Stability, uniform interpretation of rules and their harmonisation with programmes related to FPs should serve as a cornerstone for simplifying Framework Programmes. Both FP participants and the EC would benefit from simplified rules. No measures should be only unilateral.

The CZ believes that it is vital to ensure **maximum stability of rules** during the implementation of one FP. Frequent changes, new interpretation of rules and constantly changing guidance, requirements and on-line systems confuse the participants. It is also essential that all rules and systems used for submitting project proposals, evaluation and implementation be known and operational already at a time when a new Framework Programme is launched. Only unavoidable changes should be made, their **interpretation should be uniform across all Directorates General (DGs) and by all project officials** and they should not have an impact on projects whose implementation is already under way. The CZ hence wishes that the potential introduction of new rules in FP8 as a result of efforts to simplify Framework Programmes be *done at once* and in the context of launching FP8 in 2014. By that time *the process of amending necessary legislation will have been launched* (e.g. EU's Financial Regulation). At the same time, the EC should consider possible measures for the application of uniform rules and use of the same electronic systems in all DGs in charge of research and innovation issues and should disseminate a binding uniform interpretation of rules among its officials and auditors. **Continuity of the rules of Framework Programmes** should also be considered. Provided rules that follow from cost-based funding (input-based oriented) are maintained in FP8, in that case FP7 rules should be followed as much as possible. They should mainly be simplified and only necessary changes should be made, eliminating shortcomings established during FP7 implementation.

A highly desirable step would be to **harmonise** financial rules of programmes related to FPs, be it on the basis of a financial contribution received from FPs or as a result of some FP activities (i.e. ERA-NET Plus, initiative pursuant to Article 187, e.g. Joint Technology Initiatives (JTIs), initiative pursuant to Article 185, Joint Programming Initiatives (JPIs), Joint Research Initiatives (JRIs), Knowledge and Innovation Communities of the European Institute of Innovation and Technology (KICs), Public-Private Partnerships (PPPs)) or other EU programmes related to R&D&I (e.g. Competitiveness and Innovation Framework Programme - CIP); this would surely serve as a major source of simplification not only for FP participants but also for the EC itself. The CZ will appreciate if the EC takes steps in this direction. It is vital to search for fields where harmonisation of rules will lead to simplification (e.g. IT systems, administrative procedures). Besides, synergies between FPs and Structural Funds (SFs) are discussed ever more at European level. Harmonisation of their rules

would also be desirable; however, this would require a broader discussion both at EC level and at the level of Member States.

### **Result-based funding**

EC Communication COM (2010) 187 contains an idea to move towards result-based-funding, which the CZ regards as highly beneficial and believes that it will result in opening up a public debate about this topic now, well ahead of launching new FPs. The scientific content and excellence of a proposal should be the main criterion for funding and evaluation of a project.

Already FP5 and FP6 saw efforts to simplify administrative procedures. As the agenda to simplify still continues and as commissions devoted to simplification continue to be established, it may seem that the complexity of administrating FP projects cannot be removed. The robustness and excessive complexity of management rules and demands posed on research teams resulting from the above is an effect of EC's efforts to ensure due absorption of public funds by research consortia, which comprise teams originating from various national research and development (R&D) environments. **Multiple participation of certain institutions in FP projects raises a question already mentioned above, i.e. whether demanding projects are indeed delivered by the most competent teams or whether they are delivered by teams that have better knowledge of the complexity of rules necessary for project submission and management.** More attention is still paid to guaranteeing a true "not-for-profit" support of participants in FP projects than to finding out to what extent the projects achieve proclaimed objectives. In this context the CZ believes that it is vital to start considering the possibility of using result-based funding in the upcoming FP. Related to this is a recommendation to establish databases of research and development results, as follows from the results of the EUFORDIA 2009 conference adopted by the Council of the EU. In any future development such database seems to be a major step forward towards efficient use of research and development programmes, monitoring this issue and carrying out qualitative analyses, and is absolutely essential in a result-based system.

The following text describes in greater detail the position of the CZ on individual strands of EC Communication COM (2010) 187.

### ***Strand 1: Streamlining proposal and grant management under the existing rules***

#### **1. User support, guidance, transparency, IT tools and processes**

In the course of FP7 the EC introduced and still continues to develop a number of innovative IT tools and processes with the objective to streamline and simplify the implementation of projects. The CZ **supports the present efforts of the EC to continue improving these IT tools and welcomes further proposed steps, i.e. to**

expand the use of a Participant Portal (PP) for all activities related to project implementation, from project submission right up to the evaluation of final outputs. The CZ believes that PP will in the future become an intelligent and robust tool that will significantly simplify participation in FPs (instead of only introducing individual ad hoc components of the system). The steps proposed in Communication COM (2010) 187 should be part of this system (i.e. introduce e.g. electronic signature, enable automatic publication of relevant publishable project results, improve provided information). Another vital part of the system mentioned above is a **database of results**, in particular in the shape of a search database open to the public (in those cases where the nature of research allows it) similar to a database of technical information. At the same time, it has to efficiently serve for the purposes of analyses and evaluation of Framework Programmes.

Constantly changing IT tools and processes are often negatively perceived mainly by project coordinators (who have to acquaint themselves over and over again with changed rules in every reported period when sending reports to the EC or when submitting a new project) and as a result of this **IT tools become less user-friendly**. The CZ is of the opinion that **all IT tools and processes should be completed and tested before launching FP8 and that they should be stable during FP8 implementation**. Potential necessary changes in the course of FP8 should not take place on an ongoing basis (as is the case now in FP7), a number of changes covering a longer period should be made at a time.

The CZ also welcomes another change, namely the introduction of electronic signature.

The CZ truly **supports an effort of the EC to move towards the use of uniform and user-friendly IT tools in all EU programmes for supporting research, development and innovations**. Uniform and intelligent IT solutions and processes that do not overburden users with excessive registrations, user names and passwords should be used by all relevant DGs of the EC (in particular by DG RTD and DG INFSO) as well as by agencies involved in project administration. The need to harmonise is on the rise also in the context of developing cooperation in the form of Public-Private Partnerships (PPPs), etc.

## **2. Uniform application of rules**

Uniform interpretation of rules, their uniform application and coordination in planning and carrying out audits by all Commission services (including related audit bodies such as the Court of Auditors and audit companies that perform audits on behalf of the EC) contribute towards greater trustworthiness of the EC itself as well as comprehensible interpretation of rules and provide greater legal certainty for the participants. The CZ supports EC's efforts to achieve uniform interpretation and application of rules and procedures and believes it is positive that Communication COM (2010) 187 raises the issue that rules are not interpreted uniformly by

Commission services. According to the above document the EC wishes to improve the situation by providing a coherent audit programming respecting the single audit approach. Results of the first audit should thus guarantee the participants legal certainty for the rest of FP duration. Undoubtedly, this intention is the right one, but none the less **the CZ demands that the European Commission specify it more** so that the CZ can make a relevant statement about it.

### **3. Optimising the structure and timing of calls for proposals**

**Predictability of dates of call publication and deadline** would also be a certain simplification for FP participants. In this respect the CZ greatly welcomes that there be regularity every year. Besides, the EC should consider which periods of the year are the most suitable for the publication and deadline of calls (experience shows that the summer holiday period does not serve as ideal timing for call publication; likewise, the beginning of January may not be suitable as a deadline from the viewpoint of participants).

The CZ also supports EC's proposal to **prolong the period when calls are open** (i.e. when participants may form consortia and prepare project proposals). At the same time, the period from submitting a project proposal to signing a grant agreement (i.e. time-to-grant) should be reduced. In this respect the EC should aim at speeding up first and foremost the negotiation process. The CZ believes that this is realistic and viable thanks to the establishment of a central register (URF) and the need to validate organisations only when they participate in an FP7 project for the first time.

**Greater utilisation of the two-tier system of submission and evaluation of project proposals** should still continue. However, this system poses greater demands on outstanding scientific experts (mainly when applying the system of result-based funding); at the same time this system must not lead to prolonging time-to-grant.

### **4. Adapting sizes of consortia**

The issue of sizes of consortia mentioned here is not significant only with respect to reducing time-to-grant and time-to-pay, but it also touches upon the principal **issue of project management and efficiency of carried out research**. It is vital that the size of a consortium be in compliance with the optimal structure for the implementation of specific research activities and should therefore be assessed project by project. The actual text of a published call should contain relevant information about EC's expectations (a qualified viewpoint) as concerns the size of a consortium. As regards the size of consortia in general, the CZ is in favour of establishing smaller consortia. Large consortia should only be established when it is justifiable from the scientific viewpoint.

It is not clear whether reduction in the size of consortia considered by the EC has the desirable potential, i.e. that it would lead to reducing the average time-to-

grant and time-to-pay. Unless the overall number of FP participants is to be reduced, the smaller size of consortia would presumably lead to a greater number of projects and hence will pose greater demands on the capacity of Commission services. Thus, the CZ demands a more detailed specification about this issue.

### **5. More extended use of prizes**

A pilot action to be carried out by the EC as part of a funding model based on the use of prizes should be preceded by a sufficient clarification of the application and operation of this model. From the viewpoint of the CZ it is not desirable to apply prizes as a form of funding on a flat basis and prizes should therefore be used as a complement to the existing system of grant provision. Likewise, the use of prizes requires high qualifications of evaluators, whose decision would thus guarantee excellence of supported projects. The use of prizes could also pose greater demands on Commission services and that is why **it is necessary to further clarify the proposed steps**. First and foremost, the CZ will welcome an explanation as to how the principle of prizes will help to build ERA and which strategic objectives this model will support.

## ***Strand 2: Adapting the rules under the current cost-based system***

### **1) Broader acceptance of usual accounting practices**

The CZ greatly supports EC's proposal pertaining to a broader interpretation of the eligibility of costs with regard to various national and institutional specifics, i.e. to consider costs eligible provided they are registered in the participant's accounts in accordance with the organisation's usual accounting practices and provided they are in compliance with valid national accounting and auditing standards. This principle should be applied in all categories of costs and mainly when applying actual overhead costs in FP8 projects (full costing) as well as in the context of the possibility to use average personnel costs.

If the objective of this measure is to reduce the error rate in FP projects and to prevent the setting up of parallel accounting systems and organisation rules purposefully for the sake of FP projects, it is necessary to realise that this notion requires a **clear interpretation of de minimis rules and FP principles as well as greater trust from the EC** (vis-à-vis national rules and research organisations). There has to be a clear binding interpretation of the basic framework of FP financial rules, which has to be used also when an organisation applies its usual accounting practices. Organisations that will act in good faith in accordance with the above rules will thus have certainty that they will pass subsequent audits without a finding. Should a situation occur that is not clearly discussed by the rules, both the EC and the auditor should incline to the usual practices followed by a given institution (this

prevents the existence of grey zones that are left to a subjective interpretation of the EC or the auditor and that allow an additional interpretation or a different interpretation from a previous audit).

This measure seems to be more efficient than an attempt at exhausting FP rules that would describe in detail all possible situations that may occur in FP projects (which would not be possible anyway with regard to the diversity and variety of national legislations and member organisations).

## **2) Average personnel costs**

Average personnel costs should be used in FP projects in accordance with usual accounting and management practices of a given institution, i.e. by those entities that really commonly use average personnel costs in reporting their activities (both vis-à-vis e.g. national providers and in job orders), and also pursuant to the rules that these entities commonly apply. Average personnel costs should not be purposefully used only for the sake of FP projects. As the EC proposes, these costs should be based on actual costs registered in the accounts of an organisation and double funding must not occur. The EC should also clearly declare that potential deviations between reported averages and actual figures will not be regarded as profit from a project. Should this not be done, entities that apply average personnel costs in FP projects will have legal uncertainty and there will be room for a subjective interpretation by the EC and auditors.

The CZ believes there is only a limited possibility to have the average personnel cost methodologies certified by national authorities. This shifts the administrative burden from the EC to national authorities. Furthermore, we have to realise that not all countries actually have bodies entitled to perform such certification. For the purposes of applying average personnel costs in FPs, certification by national authorities should thus be a possibility, but not a necessary precondition.

The possibility to use average personnel costs in FPs is often misunderstood and misinterpreted by beneficiaries and the EC should therefore focus more on providing a clear interpretation of the above rules.

*At present, most organisations in the CZ do not commonly use average personnel costs in R&D projects, as Czech providers do not require the use of average personnel costs in national projects aimed at supporting R&D. Only one application to have average personnel costs certified was filed in FP7, but it was subsequently withdrawn since the organisation failed to meet strict conditions defined in Commission Decision of 6 June 2009. Nevertheless, the CZ demands that planned simplification take place in this field.*

## **3) Limiting the variety of rules**

In general it may be said that the CZ welcomes the possibility to apply a common set of basic principles as opposed to an attempt at defining all sorts of situations and exemptions (also with view to the fact that it is impossible to capture all national and institutional specifics, as described already in 2.1.), i.e. at having a tailor-made approach. On the other hand we have to realise that we cannot have a one-size-fits-all principle, which is not suitable since it may not reflect the economic reality and specific features of organisations. It is hence vital to search for a compromise, for a certain “few-sizes-fit-most”.

The CZ sees a potential simplification in **using only one funding rate** for all types of activities (it will therefore not be necessary for a researcher to monitor separately e.g. hours spent on the research and on project administration); however, not for all types of organisations. **Organisations have to be divided into several categories** that use different funding rates. A division of organisations pursuant to a definition in the Community Framework for State Aid for Research and Development and Innovation (2006/C 323/01) seems to be a possible scenario for simplification, i.e. to have small and medium-sized enterprises, large enterprises and not-for-profit research organisations. However, the question is whether it is suitable at all to alter the division of entities used already in FP7. Thanks to the introduction of a central register (URF) numerous organisations have already been validated. If new categories of organisations were to be defined in the future, all organisations would presumably have to undergo the validation process again. This would be highly non-efficient, administratively demanding and not in accordance with the objectives that the establishment of URF was to follow. Therefore, the CZ is in favour of maintaining the existing division of organisations (i.e. a higher reimbursement rate for small and medium-sized enterprises, not-for-profit research organisations, secondary and higher education institutions and not-for-profit public entities).

**The use of one single flat rate as the only option for reporting indirect costs in FP projects (for all types of organisations and projects) appears to be unsuitable and is unacceptable for the CZ.**

If an organisation is to operate on the basis of financial sustainability, it has to be able to identify and cover actual costs of its activities (including actual indirect costs related to the implementation of a project). Those needs should be paid attention to and taken into consideration in the rules prepared by subsidy providers. The rules of FP7 make it possible to use methodologies for monitoring actual indirect project costs (full costing) and have thus inspired some national providers and motivated a number of organisations (mainly universities and public research organisations) to prepare and subsequently implement such methodologies. According to a study prepared by an expert group of the EC entitled “*Diversified Funding streams for University-based research: Impact of external project-based research funding on financial management in Universities*”, the rules of FP7 are a step

in the right direction and the EC should support the adoption of full costing. The CZ fully agrees with the conclusions of the above study.

At the same time, we have to realise that not all institutions will be able to apply full costing methodologies in the near future (or that they will not be interested in applying those methodologies). The CZ hence recommends that organisations **have the possibility to choose between actual indirect costs (full costing) and a single flat rate for indirect costs** in FP8. The use of multiple rates (limits) for a flat rate for indirect costs confuses the participants and the CZ therefore does not support it (i.e. the simultaneous use of the rates of 20%, 60% and 7%, respectively).

In the context of applying actual indirect costs in FP8 projects a broader interpretation of the eligibility of costs should be used with regard to different national and institutional specifics (as has been described in 2.1). This implies that the EC has to trust national rules and national audit bodies. **To rest assured that the applied full costing methodology is of a sufficiently high quality, the EC could (where suitable and applicable) focus not only on auditing individual organisations, but also on auditing rules at national level and should consider the possibility of accepting decisions (certificates) issued by national providers for the needs of national R&D programmes.**

*At present, awareness of the importance to implement full costing methodologies is on the rise both in Europe and in the CZ, with the aim of ensuring financial stability of organisations. The advantages and disadvantages of this system are currently actively debated also by Czech universities and public research institutions. Although no university has yet applied the method of reporting actual indirect costs in the CZ at present, almost all are already discussing the issue, numerous universities have already started its preparation and we can expect that in the upcoming years (already before launching FP8 in 2014) they will already have started to apply full costing models. Financial rules of the Operational Programme “Research and Development for Innovations” (RDI) financed from Structural Funds (SFs) are one of the main stimuli for the introduction of the above models in the CZ at national level. The provider, namely MoEYS, has issued a document entitled “General rules (framework methodology) for reporting actual indirect project costs under OP Research and Development for Innovations”. These rules set forth basic requirements for the methodology so as to be at variance with neither national legislation nor FP7 rules. Besides, they have to be sufficiently general so as to make it possible for organisations to take their specific features into consideration but at the same time they have to be specific enough so as to provide a basic scope for the methodologies’ eligibility. The method applied by an organisation has to be agreed by the provider for the purposes of OP RDI. For this purpose, MoEYS has selected an audit company that will perform on-the-spot auditing pursuant to a methodology prepared and published in advance (it will be available presumably in autumn 2010).*

*The introduction of full costing is a highly demanding process both from the methodological viewpoint and from the personnel, time and financial points of view. So as to support Czech universities in preparing methodologies, MoEYS has decided to release over CZK 250 million (i.e. approximately EUR 10 million) for the preparation of methodologies (from the Operational Programme “Education for Competitiveness” financed from SFs and national resources, centralised projects for the support of the development of universities for the year 2011).*

*As is clear from the above information, the CZ has already started the process of preparing full costing methodologies at universities as well as at public research institutions. Besides, in the future national audit bodies will perform ex-ante controls of methodologies prepared by individual organisations (“certification”). With view to this development the CZ would appreciate if it would be possible to choose actual indirect costs in FP8, if national certification was recognised (of those entities that own a certificate) and if it would be possible at the same time to choose a flat rate for institutions that will not be able to or will not wish to apply full costing.*

#### **4) Interest on pre-financing**

The CZ sees several possibilities for simplifying FP financial rules in this field. However, it has to be pointed out first and foremost that pertinent legislation (mainly EU’s Financial Regulation) has to be amended accordingly where applicable.

**Fully removing the obligation to open an interest-bearing account for a project** is the simplest measure. In this alternative the EC would fully give up interest generated by an advance payment for an FP project (i.e. pre-financing). The CZ is in favour of this option.

Another possibility reflects more the existing rules of FP7 and the present situation. It should be clearly stated in this alternative that **coordinators can choose** whether an interest-bearing account will be opened for a project or not (e.g. with view to national and administrative barriers, usual practice of an institution or a strategic management decision). Provided an interest-bearing account is opened for a project, the coordinator will be obliged to report the relevant amount to the EC and the interim payment sent to the coordinator’s account will be subsequently reduced by that amount (so as to meet the condition that projects shall not generate profit).

*Pursuant to Czech national legislation all types of organisations can open an interest-bearing account for a project without any major administrative difficulties. None the less, the CZ demands that the situation in this field be governed uniformly and clearly. Numerous institutions would welcome the removal of the obligation to open a separate account for a project as well as the removal of the obligation to report potential interest generated by an advance payment.*

### **5) More lump sum elements in the current cost-based approach**

Greater (more frequent) use of lump sums in FP8 seems to be desirable in particular in personnel costs (which would remove the need to use timesheets in FP projects and would lead to an overall simplification of reporting personnel costs in FP projects). Nevertheless, it seems that the implementation of a lump sum for personnel costs could entail a problem as to how to set the amount (with regard to extensive differences in the amount of actual personnel costs not only among participants from individual countries, but also among different fields, regions and even institutions). **The CZ demands that the EC provide more information about this issue** so as to be able to evaluate whether the proposed solution would lead to simplification of the existing rules or not.

**The CZ highly supports the use of lump sums for natural persons and SME owners who do not receive a salary.** Based on experience from FP7 this rule could lead to a greater involvement of the above entities in FPs.

Any use of lump sums instead of actual costs that is under consideration should be first and foremost **discussed with stakeholders, mainly with regard to the specifics of national legislation.** The EC should also clearly define the notion of “lump sum” and related notions such as “scale of unit”. Synonyms such as “fixed amount” should not be used.

*On 23 March 2009 the European Commission adopted a decision which makes it possible to use a flat rate in FP7 projects to calculate costs related to travel, namely daily accommodation costs and daily allowances. However, this step would not represent a major simplification of FP7 rules for Czech organisations, as the use of this flat rate is not fully in compliance with Czech national legislation and the usual practice of organisations. It cannot be said that the given rule is at variance with Czech legislation; however, in order to incorporate it in the usual practice of organisations several national legal regulations have to be taken into consideration, which would require consultations with pertinent experts. Besides, a change to the internal rules of an organisation itself would entail certain administrative and other demands. As a result, this would not represent simplification of rules, but would be rather to the contrary. It seems that there is a similar situation in a number of European countries. The CZ therefore insists that the EC consult stakeholders and analyse national legislation before it decides to use flat rates in specific cases.*

### **6) Accelerating project selection**

The CZ disagrees with a proposed restriction of powers of Member States (or rather delegates of Programme Committees). The possibility to voice agreement with selected projects to be funded from FPs is the only way in which Member States can, if need be, intervene in the process of project evaluation, which guarantees greater

transparency of the whole process. The CZ does not believe that the restriction of this power would be of any major importance in reducing time-to-grant. The EC should consider whether there are any other more efficient possibilities of how to reduce time-to-grant (e.g. in the negotiation phase).

### **7) Value added tax as an eligible cost in FP8 projects**

The CZ would appreciate if identifiable value added tax (VAT) could be an eligible cost in FP8.

*Pursuant to the Value Added Tax Act (No. 235/2004 Coll., Section 81) it is possible in the CZ to claim the reimbursement of "Czech" VAT incurred in relation to implementing FP7 projects only provided a VAT deduction cannot be made. This option is open in particular to universities and public research institutions (i.e. not to enterprises) and provides a certain financial motivation at national level to participate in FP7 projects. On the other hand, it is mainly those institutions that do not commonly maintain separate VAT records in their usual accounting and management practice and that is why reporting costs without VAT in Form C for the EC entails a greater administrative burden. **From the viewpoint of the CZ the option to report VAT as an eligible project cost seems as a major simplification of administration suitable for all types of institutions.***

### **Strand 3: Moving towards result-based instead of cost-based funding**

The considered move from cost-based funding towards result-based funding is the most important proposed change contained in EC Communication COM (2010) 187, which, however, does not fall into the simplification agenda according to the CZ, but rather is a truly new approach applied in order to enhance the efficiency of FPs.

The CZ highly appreciates the effort of the EC to introduce result-based funding and supports any other activities would provide more specific information about the possibilities and mode of applying this system in FPs.

None the less, the introduction of a new system requires a **long thorough debate** that has to involve besides the EC also professional institutions that evaluate research and development, project audits, national administrations in charge of managing R&D, research organisations and other relevant players.

The CZ also believes it is highly important that the EC perform a **thorough analysis** and compares the advantages and disadvantages of the existing cost-based system as opposed to the result-based system, which should provide information about what system seems to be more efficient with regard to supporting excellent research in Europe as well as with regard to the mode of public funds absorption.

In its document COM (2010) 187 the EC speaks about testing the system in selected fields on pilot actions. If the EC would wish to launch a result-based system already for FP7, the CZ is fairly sceptical about this possibility. It seems that with view to the need to amend related legislation and a lack of time it is not viable to launch, complete and evaluate pilot actions under FP7.

In order to evaluate whether the proposed solution will indeed lead to enhancing FP efficiency (or in other words to simplifying the existing rules) or not, the EC has to provide more information/ proposals concerning this issue in the near future. The CZ would welcome answers mainly to the following questions:

- How will result/output be perceived in this system?
- How and by whom will evaluation (both ex-ante and ex-post) and project negotiation take place in this system?
- What will be the cash-flow in this system?
- Would it be viable to introduce this system already for FP8 with regard to technical, legal and other aspects?
- Is it acceptable to use a combination of a cost-based and result-based system or a combination of various approaches within the result-based system?

The CZ recommends that the EC **analyse the experience to date** with the application of similar systems both in Europe and around the world and that it evaluate whether they could serve as a suitable inspiration for FPs. Attention could be paid to e.g. European Space Agency (ESA) programmes, NSF programmes (US National Science Foundation), NIH programmes (US National Institute for Health), US Global Fund to Fight AIDS Tuberculosis and Malaria or US Agilent Philanthropic Grants.

At present and with the current limited information from the EC it is not possible to take a clear stance on the proposed result-based system and its three alternatives. We therefore only summarise below the **issues that the EC should take into consideration in the future when discussing the potential introduction of a system based on scientific results/outputs**.

It seems that the introduction of this system can have a positive impact on a lower administrative burden for beneficiaries (e.g. there will be no need to report the number of hours worked in timesheets) and FPs can thus become more attractive for excellent researchers. Besides, the errors that occur when complex FP financial rules are applied and that are identified during ex-post financial audits would undoubtedly be eliminated. A greater emphasis placed on auditing results/outputs would also contribute to spending funds more efficiently and directly on research (and not administration) as well as to a higher motivation of researchers to achieve scientific project objectives.

On the other hand, it is highly problematic e.g. to have a uniform and acceptable definition of an output/result in the result-based system (so that it is

measurable, sufficiently ambitious and acceptable for all types of entities). It can also be difficult to determine the flat rate amount for a project (taking into account different levels of costs, including wage ones, at national/regional/institutional and individual level). Furthermore, it can also be difficult to take into account different needs and intervention logic of various types of projects (beginning with basic research and applied research right up to innovations; from individual projects to cooperation projects implemented by a large number of organisations) and increasing demands for EC services and expert evaluators (with a potential impact on FP budget and expert scientific and financial level of project evaluation).

*Ministry of Education, Youth and Sports,  
Committee for the European Research Area,  
Technology Centre of the Academy of Sciences of the CR (National contact  
organisation for FPs)*

*This document was consulted with stakeholders from both academic and industry  
fields*

**Contribution by the Ministry of Industry and Trade of the Czech Republic  
to the public consultations on a successor programme to the Competitiveness and  
Innovation Framework Programme (CIP) 2007-2013**

*February 2011*

Given the priorities and views described below, there is a need to stress the importance of CIP for increasing the competitiveness of the EU. We are convinced that this programme now and its possible successor in the future would contribute to reaching the goals of the Europe 2020 Strategy (the requirements for smart, sustainable and inclusive growth), since its aim is to encourage the entrepreneurship and support of innovation (eco-innovation), ICT and energy efficiency and the use of renewable sources of energy. **Areas covered by the three pillars therefore should remain at the centre of our attention and slightly be broadened so as to reflect current trends and Europe 2020 flagship initiatives** (see comments on the pillars below).

We see the clear added value in having a programme covering the phase that brings ideas and research results from the demonstration phase into practice and enables pilot actions of innovative solutions in real settings and commercialisation of innovative ideas. Improving framework conditions targeting the business environment should continue as this enables and stimulates enterprises to take up new technologies and processes.

**A balance and synergies between the possible successor of CIP, FP8 and operational programmes financed by Structural funds should be further ensured. The main priorities of these programmes, particularly those of FP8 and CIP II, should be closely concerted and inter-correlated to assure that the gap between R&D and market applications of respective R&D results is fulfilled.**

Another question of fundamental importance with respect to future CIP II programme revolves around the intrinsic nature of CIP programme itself. CIP as we know it today essentially aims at **support and cultivation of innovation environments**, its legal and market environments as well as at a range of associated **indirect measures** (e.g. networking, ICT development, educational activities etc.). The key question, however, is why CIP II should not provide **direct support to the projects** enabling the R&D results (especially those stemming from FP8) to reach the market? In other words, we clearly feel that much stronger, aggressive market-oriented, practical support of individual projects of the forthcoming CIP II would be an asset. In this respect, our judgement is in full accord with the current conclusions of the Expert Panel on Services Innovation in the EU that suggested, as a key element of the future CIP II, so-called **demonstrator approach** for the development of innovation services. The demonstrators provide a staged process in which a range of alternative

solutions are initially developed, tested under **real market conditions** and then selected for further round of support and/or direct introduction to the market.

The division into three operational programmes helps in clear orientation inside the programme. However it could be useful to unify requirements on national contact points. Also, the official web site of CIP could become user-friendlier. Contrary to the ICT-PSP and the IEE programme there is not a special web site dedicated to the EIP, only the structure of the programme containing some description and links can be found. Especially for an entrepreneur browsing this web site for the first time it could be confusing.

Because the programme and projects carried out are based on international cooperation, **it would be useful to provide a unified partner search instrument for the CIP programme**. That way companies interested in taking part in the CIP can more easily find and join a consortium preparing a project in their field of interest. This would also facilitate the entrance of new companies into the programme. Until now, in many cases experienced companies were more successful in obtaining funding which lead to a narrow portfolio of companies involved in CIP. The possible successor of CIP should be designed user – friendlier so that a wider range of companies can participate in it.

In view of the importance and weight of small and medium-sized enterprises in the EU economy **we consider having a programme targeted mainly at SMEs highly relevant**. The programme contributes to reach the goals of the Small Business Act and helps to create linkages between the SBA and the Innovation Union flagships initiative.

**Enhanced contact with the European Commission in terms of receiving information on the outcomes of the evaluation of the calls for proposals more in time would be welcomed by the national authorities and national contact points** (particularly on project success and failure).

Some of the **financial instruments** of the current programme have a high leverage effect (up to 10 times of the amount of funds invested) and lead to closer cooperation with the private sector, hence **have a high economic impact**. Experience with new types of instruments in the current programme should be definitely used in preparation for the period after 2013. This could be one of the pluses of the possible successor of CIP.

Having said all this, **an increase in finance allocation for the possible successor of CIP should be considered and, moreover, the real EU added value of its interventions must be ensured in order to have a more significant influence on the competitiveness of the EU**. This is fully in compliance with the necessity for the next multiannual financial framework to reflect the strategic importance of R&D&I and tackle societal challenges.

To conclude, we are fully convinced of the effect of most CIP actions and the relevance of the CIP measures to foster competitiveness and innovation. This is a confirmation of the need to foster competitiveness through innovation for creating more jobs and growth in the EU and to reinforce the work done under CIP in the years to come.

### ***Entrepreneurship and Innovation Programme (EIP)***

A great interest from applicants for the eco-innovation call showed a potential for a bigger amount dedicated on that area. Also a need to have a wider range of financing options for eco-innovative SMEs (debt, equity etc.) and financing tailored to smaller scale projects was noted.

Pilot actions on key technologies, such as nano, biotech or space-related technologies, could be launched.

Promoting all forms of innovation in SMEs, including non-technological innovation and design, should be envisaged.

A certain flexibility in terms of covered areas could be useful; with view to fast changing conditions emerging needs could be tackled in due time. Financial instruments for SMEs (like equity financing and guarantees) are useful among others by covering different phases of the lifecycle of SMEs. Nevertheless steps should be taken to address more financial intermediaries in Member States and to enhance their benefits from participating in this scheme by signing an agreement with the EIF. That would enable all European SMEs to profit from this initiative (No financial institution from The Czech Republic signed a contract with the EIF as a financial intermediary yet).

Concerning different studies, analyses and support to exchange of best practice, we welcomed the continuation of the INNO-Policy Trendchart, which is very useful for uptake of the best practices in innovation policy.

The Enterprise Europe Network is already well established; regional coverage of all the partners from the consortia as well as close cooperation with different institutions providing support of entrepreneurship and innovation guarantees quality and free of charge services and information. The option of assistance in technology transfer and business matching contributes to increase of the EU competitiveness.

We fully acknowledge activities related to SME support on third markets and their internationalisation. Such an example could be SME IPR Helpdesk or EEN gateways to foreign countries like China or South Korea. Financial instruments for fast growing firms that wish to expand on global markets should be considered and services provided by EEN in that area could be strengthened, other countries should be covered.

We noted with interest and support the attention the European Commission is paying to review and improve indicators monitoring measures in order to reflect the expected impact and result of actions.

### ***ICT Policy Support Programme (ICT-PSP)***

We see the role of ICT and especially the support of the use and implementation of ICT solution to be essential for support and execution of the Digital Agenda for Europe.

The programme should increase coordination and exchange of best practices between national/regional administrations regarding business related policies and provide a platform for cooperation between the public administration and private sector in a way that would benefit the citizen and development of the single market.

Therefore the new programme should promote eGovernment services as an area that involves not only citizens but also private sector. This should be done not only through large-scale pilot projects, but also smaller projects that can serve better in testing solutions in through several states that be can in case of success further expanded.

The programme should in partnerships with industry prompt development of specific skills that would allow to further benefit and exploit the ICT (such as eSkills, IPR skills, innovation management skills).

The future EU programme for the ICT PSP area should enhance direct support, which would support pilot actions in form of grants, testing innovative solutions in real market settings and allow them to enter the single market area to become competitive and sustainable.

With regard to the tools we see a need to consolidate them into a coherent set e.g. Thematic Network and the Best Practice Network should be merged into a single instrument. We see however the Thematic Networks as important tool that should be kept and utilized for the new CIP programme, which helps to unify the various stakeholders and promote available technologies throughout the market towards the companies as well as the end users.

The CIP programme offers a functional and tested programme which can be used to encourage private and public stakeholders to fulfil the goals of Digital Agenda by promoting, monitoring and benchmarking the development of ICT and of the single digital market in Europe, by consensus building, stimulating the deployment of interoperable pan-European ICT based services, stimulating demand for innovation, increasing focus on the support of large partnerships for ICT solutions addressing key societal challenges, promoting ICT innovations at EU level, supporting specific actions for improving access to finance for innovative ICT SMEs, supporting specific actions for stimulating innovative public procurement on ICT.

Any successor to the CIP 2007-2013 should have the potential to highlight the importance of competitiveness-related expenditure in implementation/introduction of new technologies from the research in the digital single market. Its goal should be

to enhance the technological and innovation competitiveness of the EU products in the global market. It should turn the EU into a smart, sustainable economy delivering high levels of employment, productivity and adaptability to new market demands. Depending on the final design its role should be to facilitate the tools for the flagship initiatives: 'Innovation Union', 'Industrial policy for the globalisation era', 'A Digital Agenda for Europe', 'Resource efficient Europe' and 'An agenda for new skills and jobs'.

It should aim at giving support by providing adequate and accessible information focusing on key enabler technologies such as nanotech or biotech and skills, renewable energies and energy efficiency.

Providing the basis for internationalisation of enterprises to help them reap greater benefits from the EU and global markets and bringing the supporting mechanism for eco-innovation, green and innovation-friendly public procurement. Ensuring that the digital technology and the digital economy are fully exploited in Europe; supporting the deployment of interoperable pan-European ICT-based services and high-growth SMEs in ICT.

### ***Intelligent Energy Europe Programme (IEE)***

The current objectives of the programme (as set out in the Article 37 of the CIP Decision is to contribute to secure, sustainable and competitively priced energy for Europe) by providing for action:

- to foster energy efficiency and the rational use of energy resources;
- to promote new and renewable energy sources and to support energy diversification;
- to promote energy efficiency and the use of new and renewable energy sources in transport.

should continue for the next period 2014-2020.

We also fully support the current way of managing the IEE Programme. The management of the IEE grants and part of the public contracts is delegated to the Executive Agency for Competitiveness and Innovation (EACI). Directorate General for Energy and Transport manages part of the public contracts for actions of a strategic nature, especially studies for preparation, implementation and evaluation of energy efficiency and renewables policy.

Large part of the IEE budget is allocated to the Promotion and Dissemination actions.

Concerning our recommendations for the CIP IEE Programme, we think that Member States should be provided with information on the numbers of applications for and take-up of CIP instruments by actors in their countries. Also, the Commission should continue to take steps to simplify administrative arrangements.

The Commission should develop a communication and dissemination strategy for CIP. It should reflect stakeholders' demand for simple, coherent and tailored messages.

The Commission should continue in development of appropriate monitoring and evaluation of the programme (in complementarity to FP 7/8 and Structural Funds monitoring and evaluation). The Commission should pay attention to the potential overlaps with other EU programmes and financial instruments.

Prague 1.2.2011