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Third Czech National Research Programme (2009-2014)

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Organizer: Technology Centre AS CR, Karel Klusacek (Director)
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Purpose

A national foresight exercise aimed at identifying research priorities for the Czech National Research Programme III, through which about 20 % of public R&D funds are to be allocated from 2009 to 2014.

The Objective: Focusing National Public Research Funding

A foresight exercise as a means of identifying research priorities for the purpose of setting up a National Research Programme (NRP) for public funding of research was conducted for the third time in the Czech Republic. The first project was carried out in 2001 in preparation of the first NRP (2004-2009) and was based on the National Policy for Research and Development adopted by the Czech Government in 2000. This policy clearly stated the need to identify research priorities for national public funding in order to focus limited public resources for research and to provide funding in a coordinated way. A foresight approach was chosen as a means for arriving at such priorities in a transparent, systematic process involving a broad range of stakeholders and thus by a participatory approach.

The first exercise was a multi-sectoral, technology-focused one; its methodology was based on the key technologies approach,

and expert panels were set up involving almost four hundred experts. The main objective was to identify research priorities with a potential for promoting economic development and social welfare. The second round of the national foresight exercise was conducted in 2003 to 2004. A multidisciplinary expert panel was established to identify important problem-oriented issues and possible solutions through research. Prioritization was based on the most urgent needs, the interests of application sectors and feasibility. In order to explore the private sector's interest in co-financing specific research areas, interviews were conducted with business representatives.

The National Research Programme III (NRP III) is based on the Czech National Research and Development Policy (2004-2008) and its broadly formulated Long-term Principal Research Directions.¹ The programme will be running from 2009 to 2014

¹ On 1 June 2005, a set of "Long-term Research Directions" was adopted by the Czech Government as an amendment to the National Research Policy (2004-2008). Sustainable development, molecular biology, energy sources, materials, competitive mechanical engineering, information society, security, and social sciences were defined as such areas of research.



and can be expected to allocate about 20% of public R&D funds². Research funded by NRP III is assumed to translate into practical applications by 2015 to 2020.

The Process: Applying Foresight in Research Policy-Making

The Czech Government, through the Ministry of Education, which is responsible for R&D policy, initiated the project leading up to the proposal of the NRP III. The Technology Centre AS CR coordinated it. The project took place from June 2006 to June 2007.

The following methodological principles were defined:

- problem-oriented approach,
- multidisciplinary character,
- panel of experts (about 70 people) – meetings combined with electronic communication (a web site was established),
- combination of analyses of the current situation prepared by the coordinating team and scenarios generated by invited experts,
- combination of exploratory scenarios (“possible future”) and normative scenarios (“what to do and when to do it for the desirable future to happen”).

The project consisted of two main stages: analytical work and desk research (July-September 2006), and work involving a group of experts (November 2006-May 2007).

1) The Analytical Phase – work preceding the work of the expert group:

The coordinator’s team at the Technology Centre AS CR prepared the analyses listed below – to provide a basis for the work of the expert group:

- R&D Analysis:
 - R&D output – scientific publications, patents,
 - allocation of R&D funding,
 - innovation potential of Czech regions,
 - analysis of preliminary project proposals elaborated in the context of preparing applications for financing through the EU Structural Funds in 2007-2013,
 - international cooperation of the Czech Republic especially in the EU Framework Programme,
 - analysis of the existing National Research Programme.
- Structural Analysis of Czech Economy
- Analysis of Human Resources for R&D

² The remaining 75-80% of public R&D funds will be allocated especially to funding research institutes, to specific research at universities, as well as to grants for bottom-up research projects.

- Review of R&D-related Strategic Documents

Based on the above analyses, it was concluded that the NRP III priorities should reflect

- above-average and excellent fields of basic and applied research,
- dominant fields in international research cooperation,
- fields demanding development of research infrastructure (EU Structural Funds),
- allocation and distribution of R&D funding and its dynamics,
- development of the economic structure of the Czech Republic since 1990 in relation to the long-term principal research directions.

2) The Expert Group

A multidisciplinary panel of experts (~ 70 experts, representing a wide range of academic disciplines ranging from socio-economic fields to technical areas) was set up. Its main objective consisted in identifying key opportunities and challenges for the Czech Republic in the period from 2015 to 2020, to which research supported by the NRP III could make a contribution, and in specifying thematic research directions.

The applied methodology consisted of a *combination of exploratory and normative scenarios*. First, the experts were asked to suggest topics and outline a business-as-usual scenario for each topic, resulting in a probable future state of the area concerned. As the experts were not experts in developing scenarios, the method they were to follow was quite simple in terms of filling in text in a template structure on the following issues:

- topic/issue proposed,
- probable future development – locally and abroad, a likely situation in the Czech Republic in 2015-2020, and consequences of such a development,
- objectives achieved and benefits for the Czech Republic should the opportunity be exploited or the threat avoided,
- research to be supported related to the topic/ issue.

Once the topics were collected, they were sorted, grouped or aggregated into thematic areas, which would represent the main level for opening calls for project proposals for the NRP III. At this stage, the experts were asked to outline normative scenarios related to each thematic area (group of topics/issues) in terms of suggesting what would need to be done to either achieve the desired state (i.e. opportunity) or to avoid an undesirable situation (i.e. a threat) in the future. The template was designed to build normative scenarios concerning the

- situation in the Czech Republic and abroad,
- description of the desired state concerning the area in question in 2015-2020,
- objectives to be achieved and their justification,
- expected benefits,

- research to be supported so that the objectives are met, and
- measures needed for achieving the objectives and the desired state in the future.

Simplified templates for topics/issues within the thematic areas were also developed. Thirty-four thematic areas were defined and grouped into four thematic priorities for the purpose of administering the NRP III.

The experts met twice; between meetings they were supposed to provide input to the website application developed for the purpose of facilitating (electronic) communication within the group. Upon completion of the experts' work in May 2007, the coordination team at the Technology Centre AS CR compiled the final report (i.e. proposal of the NRP III) and submitted it to the sponsor (Ministry of Education) in June 2007.

Results: Priorities for NRP III

The thirty-four thematic areas (TA) were grouped into four thematic priorities (TP):

- TP-1: R&D FOR A COMPETITIVE INDUSTRY (10 TAs)
- TP-2: MOLECULAR BIOLOGY FOR HEALTH AND PROSPERITY (4 TAs)
- TP-3: INFORMATION SOCIETY (9 TAs)
- TP-4: SOCIETY AND ENVIRONMENT (11 TAs)

Thematic Areas of TP-1 (R&D for a Competitive Industry):

- 1-A Renewable Energy Sources
- 1-B Nuclear Energy
- 1-C Effective Use of Fossil Energy Sources
- 1-D Power Systems and Networks
- 1-E Integrated Mechanical Engineering
- 1-F New Production Technologies, Machinery and Devices
- 1-G Competitive Transport Mechanical Engineering
- 1-H Nanomaterials, Nanostructures and Nanotechnologies
- 1-I Microstructures and Components
- 1-J New Materials for Increasing Competitiveness

Thematic Areas of TP-2 (Molecular Biology for Health and Prosperity):

- 2-A New Analytic and Diagnostic Methods
- 2-B New Treatment Methods and Drugs
- 2-C Advanced Biotechnologies

- 2-D Genome and Proteome in Health and Illness

Thematic Areas of TP-3 (Information Society):

- 3-A Intelligent Environment
- 3-B Advanced Robotics
- 3-C Computer Modelling and Simulation
- 3-D Monitoring and Diagnostic Systems
- 3-E Processing and Presentation of Knowledge
- 3-F Biomedical Informatics and e-Health
- 3-G Intelligent Transport Systems
- 3-H Network and Communication Infrastructure
- 3-I New Computing and Software Architectures

Thematic Areas of TP-4 (Society and Environment):

- 4-A Development of Life Quality and Sustainability
- 4-B Impacts of Global Environmental and Climatic Changes on the Territory of the Czech Republic
- 4-C Optimal Land Use
- 4-D Food for Healthy Nutrition
- 4-E Safe Society
- 4-F Protection of Population, Environment and Critical Infrastructure
- 4-G Population Trends in the Czech Republic and Their Political, Economic and Social Implications
- 4-H Governance, Public Administration in the Czech Republic and EU
- 4-I Competitiveness of the Czech Republic, Labour Market, Education
- 4-J Social Cohesion and Marginalization
- 4-K Czech Identity

The four TPs are based on the broad priorities as defined by the Long-term Principal Research Directions (cf. fn. 1).

The proposed priorities of the National Research Programme (2009-2014) are subject to the Government's approval. In addition to the thematic priorities, accompanying and supporting measures (policy measures, legislation, national R&D system, human resources) were also specified in the NRP III proposal.

Once approved, the NRP will also serve as a guideline for selecting priority areas for infrastructural investments into research capacities using EU Structural Funds (> € 5 billion in 2008 – 2013).

Policy Implications

The principal ambition of the project consisted in identifying national research priorities based on the existing National Research Policy with its broadly defined research priorities (Long-term Principal Research Directions) formulated by expert committees on behalf of the R&D Council, an advisory body to the Czech Government.

Upon Government approval, the National Research Programme will be administered by a designated body or bodies and will help allocate public funds for research in a more focused and coordinated way.

Key Issue:

Reconciling EU and National Research Funding

The research priorities as such are a key issue as well as how to further prioritise them with respect to research to be conducted and specific research infrastructures to be developed with support from the EU Structural Funds in 2008 to 2013. There are two main aspects to this that need to be tackled when closely interlinking EU Structural Funds for R&D infrastructure and the NRP III for financing R&D at such facilities: 1) EU funding for research infrastructure cannot be used in Prague, because the Czech capital is not eligible for support due to a GDP per capita above the EU average. Hence, linking the NRP III as a source for funding research at research infrastructures developed with EU funds would, in consequence, exclude the Prague region from the programme. 2) A decision needs to be made on which research infrastructures are to be

preferentially supported from the EU Structural Funds and what research is specifically to be sponsored there by the NRP III (on condition of shared priorities).

The discussion on research priorities is thus closely related to priorities in building research infrastructure. The question is to what extent research will be funded that falls into the priorities as defined by the NRP III and is not related to newly developed research infrastructures.

Opportunity: Centres of Excellence

A limited number of European centres of excellence with a quality research infrastructure fully capable of contributing to the European Research Area are to be built in the Czech Republic using the EU Structural Funds in 2008-2013. Such centres are expected to combine research, education and innovation and to generate research resulting in commercial applications. Biotechnologies and biomedicine, molecular biology and material science, as well as information technologies and cybernetics are prime candidates for large infrastructure investments in accordance with the priorities formulated in the proposal of the National Research Programme III.

Besides NRP III, national public R&D funds will further be allocated to specified research programmes, to bottom-up research projects by means of grants, and to financing of existing research institutes, which will be based on stricter evaluation criteria.

Sources and References

Ministry of Education of the Czech Republic: www.msmt.cz

Technology Centre AS CR: www.tc.cz

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