

# ● České fórum pro výzkum, vývoj a inovace 2011

Alokace veřejných prostředků a hodnocení výsledků  
vědy, výzkumu a inovací

**Czech Research, Development  
and Innovation Forum 2011**

Allocation of public resources and research assessment

*Mezinárodní konference organizována Ministerstvem školství, mládeže a tělovýchovy v rámci projektu Mezinárodní audit výzkumu, vývoje a inovací v ČR a implementace jeho výsledků do strategických dokumentů.*

## ● Sborník přednášek

**20.4.2011  
Olomouc**

**Místo konání: Univerzita Palackého v Olomouci,  
Přírodovědecká fakulta, 17.listopadu 1192,  
Olomouc**



evropský  
sociální  
fond v ČR



EVROPSKÁ UNIE



MINISTERSTVO ŠKOLSTVÍ,  
MLÁDEŽE A TĚLOVÝCHOVY



OP Vzdělávání  
pro konkurenceschopnost

INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ



**Erik Arnold** is co-founder and Chairman of the Technopolis Group and is additionally Extraordinary Professor in International Innovation Policy at the University of Twente. He has worked in research and innovation policy and evaluation since 1980, covering work in a wide range of disciplines handling research and innovation policy. His work spans over 30 countries as well as the European Commission and a range of international organisations including the OECD, World Bank, Nordic Council of Ministers, ESF and COST. He is expert in the design, management and implementation of large- as well as smaller-scale evaluations of research and innovation organisations, programmes and policies. He has particular expertise in integrating peer review and social-scientific evaluation methods.

Erik Arnold teaches evaluation at masters' level at the Universities of Manchester, Sussex and Twente as well as various short courses in evaluation. He is a Trustee of the Fraunhofer-ISI institute, a member of the scientific committee of the Institut für Qualitätssicherung und Forschungsinformation of the DFG and a member of the editorial board of the journal Research Evaluation. He holds a BA(Hons) degree in English Literature, an MSc in History and Philosophy of Science and a Doctorate in Science Policy and Microeconomics, all from the University of Sussex. He worked formerly at the Science Policy Research Unit, the University of Sussex, the European Commission and as a management consultant with Booz.Allen & Hamilton.



**Bea Mahieu** joined Technopolis as a senior consultant in September 2009 from Databank, Milano, where she was a senior consultant and Head of the International Business Unit. Databank (now Cerved Group) is a leader in market research and competitive intelligence in the Italian market. She works in the area of public policies related to R&D, information society, economic development, and systemic innovation - at European and regional level. Her specific expertise is in the field of evaluation, benchmarking, and ex-post socio-economic impact analysis, as well as the assessment of the efficiency and effectiveness of public governance organisations and systems. She worked formerly in Prague at Inventa Consulting, a leading Czech management consultancy, where she was director of the international programmes department and acted as trainer-consultant in Database Marketing techniques. Bea holds a BA (Hons) in Slavic Philology from the University of Ghent (Belgium) and a Postgraduate Certificate in Czech Literature from the Charles University in Prague (Czech Republic).



**Barbara Good** joined Technopolis in February 2007, from the Socio-Economic Institute at the University of Zürich, Department of Innovation Economics and Innovation Policy, where she worked as a lecturer and researcher. Her areas of specialisation are innovation policy, economics of innovation and evaluation. She has co-authored several books on the Swiss innovation system and Swiss innovation policy and worked as an evaluator for the Swiss federal government. Barbara also worked as a researcher at the ETH Zürich, at the Department of Environmental Sciences, Institute of Environmental Policy and Economics, and at the Institute of Political Science, at the University of Zürich. Barbara holds a PhD in Political Science with Economics and an M.A. in Political Science and Economics, both from the University of Zürich. In addition, she has a degree in applied modern languages.



**Alfred Radauer** holds the position of a senior consultant at Technopolis. He has a proven track record of more than 12 years of conducting evaluations and innovation-related studies, foremost in the area of Intellectual Property Rights (IPR). Alfred Radauer worked in particular on benchmarking IPR support services for SMEs. He has reviewed more than 300 such services for SMEs in the EU and overseas, both in the course of international benchmarking studies and national analyses. He further elaborated for various international and national bodies on IPR topics such as technology transfer, counterfeiting and piracy, patent information usage, the European copyright system, national and international IPR policies or the valuation of single patents. Alfred Radauer is a frequently invited expert in workshops and conferences organised by either the European Patent Office (EPO) or the World Intellectual Property Organisation (WIPO). Currently, Alfred Radauer heads the Technopolis team within a consortium for a study on patenting and licensing behaviour to measure knowledge flows, recently commissioned by DG Research. Alfred Radauer holds a master's degree in international commerce from the Vienna University of Economics and Business Administration.



**Jon File** holds a first-class Honours degree in Sociology from the University of Cape Town. His career has been primarily in university planning and management, having held the posts of Director of Academic Support Programmes, University Planning Officer and Academic Secretary at the University of Cape Town between 1980 and 1997. He was a member of the 13-person National Commission on Higher Education

(1995/6) appointed by the new South African government to make proposals for the transformation of higher education. He joined CHEPS in 1998 and served as Executive Director from 2004 until 2009.

His current interests are comparative perspectives on the effects of governmental policies on higher education institutions; planning at the institutional and systems levels; higher education reform in the context of major socio-political transformation; and the development of higher education leaders and managers through education and training programmes. Since 2009 he has been a visiting fellow of the L.H. Martin Institute for Higher Education Leadership and Management, University of Melbourne, Australia and a contributor to the Ed.D programme in higher education management of the University of Georgia, USA.



**Louis Schlapbach** is senator of the Helmholtz Association for the Research Field “Energy”, former CEO of EMPA and a member of the innovation promotion agency of Switzerland (CTI). He graduated from the Swiss Federal Institute of Technology Zurich in Experimental Physics and got his PhD in Solid State Physics - Magnetism also at ETH Zurich. As a postdoc at a Centre National de la Recherche Scientifique (CNRS) laboratory in Paris, he studied hydrogen storage in intermetallic compounds.

Back at ETHZ, he developed the surface science aspects of the hydrogen interaction with metals and alloys. After research positions at IBM Almaden Research Center in San José, Université Paris-Sud, Hebrew University Jerusalem and University Mexico-City, he returned to Switzerland and became Full Professor for Experimental Physics at the University of Fribourg in 1988. As such he built up a research team working on the topic of New Materials and their Surfaces. Before he was appointed as vice-rector of the University of Fribourg, he was on sabbatical at Stanford University. He has been member of the Swiss National Science Foundation (SNF) since 1997 thru 2004. Since 2001, he has been CEO of EMPA, the materials and science and technology institution of the ETH domain, and at the same time Full Professor of Physics, first at the EPF Lausanne and afterwards at the ETH Zurich. He was conferred emeritus status in July 2009 and holds positions in various science organisations – for example, he is member of the Federal Energy Research Committee (CORE) and of the Swiss Academy for Technical Sciences (SATW). He is also on the Scientific Board of various foundations, such as Hasler Foundation and the Dr h.c. Robert Mathys Foundation (RMS).



**Liudvika Leisyte** completed her PhD at University of Twente in 2007. Currently, Liudvika is a Senior Research Associate at CHEPS. From November 2008 to August 2009 Liudvika was a visiting scholar at the Center for European Studies at Harvard University where among other activities, she pursued a research project on research commercialisation in the US and Europe. In 2008, Liudvika received the Early Career Best Paper Award at the PRIME conference in Mexico City for the paper on professional autonomy of university research units.

Her research interests include research governance and management, academic work, and academic entrepreneurship.



**Michael Dinges** is senior researcher and assistant leader of the research group Technology, Innovation and Policy Consulting at POLICIES - Centre for Economic and Innovation Research of JOANNEUM RESEARCH. He graduated in economics at the University of Vienna.

Michael Dinges joined JOANNEUM RESEARCH in 2003. Since then he was active in various national and international research-, evaluation- and consultancy projects, for which he makes use of his extensive knowledge in applied quantitative and qualitative methods of social and economic research. His main areas of research and expertise are in the field of research and innovation policy, indicator development and evaluation methods.

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## Second Interim Report of the Audit of the Czech Research System

*Introduction to the Workshop*

*20 April 2011*

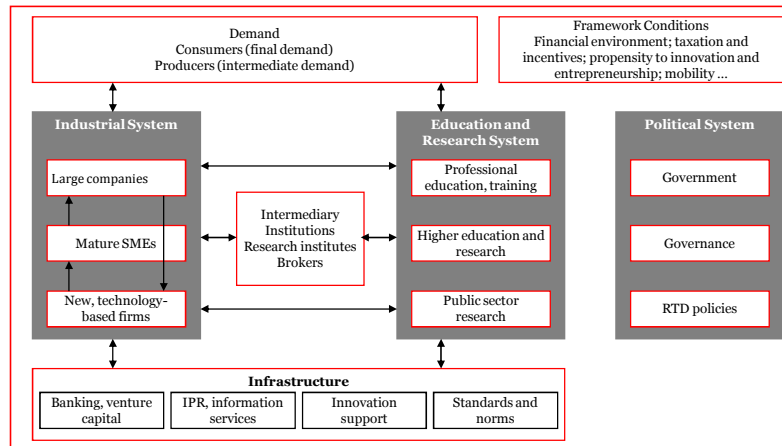
*Erik Arnold  
Technopolis Group*

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### The Research Audit

- Analyses
  - *Assessment of public expenditure for R&D&I (a)*
  - *Evaluation of the state administration of R&D (b)*
  - *Evaluation of R&D programmes (c)*
  - *The level of R&D institutions (d)*
  - *The relation between research and application spheres (e)*
  - *Human resources (f)*
  - *International co-operation (g)*
- Team
  - *Technopolis (lead)*
  - *Joanneum Research*
  - *MIOIR, U Manchester*
  - *CHEPS, U Twente*
  - *CWTS, U Leiden*
  - *Peritus*
  - *Ivo Šanc*
- Counterpart
  - *Technology Centre of the Science Academy*

Overall, the Audit is about improving the role of research in the 'National Innovation System'



Source: Erik Arnold & Stefan Kuhlmann, 2000

This perspective has important implications for performance and governance

- Innovation is a non-linear process involving many actors
- Institutions are inter-dependent and co-evolve in ways that may be specific to the national system
- Good systems performance depends upon intelligence and performance in all sub-systems and institutions
- 'Bounded rationality' causes path-dependency and means both institutions and learning affect performance
- 'Bottleneck analysis', system development and change agency are key policy roles
- Innovation system complexity tends to defeat central planning but distributed intelligence enables a healthy mix of bottom-up and top-down policy design and implementation ('subsidiarity')



### Emerging issues (1)

- Research quantity and quality improving but further to go
- BERD should increasingly involve large firms, MNCs
- State research resources should continue to underpin existing activities but also develop new, high-potential fields
- Cooperation within the research system should increase, to minimise fragmentation and make best use of resources
- National research policy needs a more explicit regional dimension
- University governance, research management and funding systems impede mobility, the development of critical mass and ultimately the achievement of quality

### Emerging issues (2)

- The R&D&I governance system is over-centralised, inconsistent with good international practice and needs reform
- A more decentralised system with distributed strategic intelligence is needed, empowering other parts of the system
- The EM should be replaced by a system that mixes formula funding with 'soft steering' via performance contracts
- Evaluation practice should focus on outcomes and impacts, not output, so that it can actually play a role in understanding and increasing the effects of policy

### Practicalities for the afternoon

- Parallel workshops
- Workshop assignment
- Workshop locations
- Mechanics of reporting back to the plenary session at 16.00

Thank you

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[erik.arnold@technopolis-group.com](mailto:erik.arnold@technopolis-group.com)

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## R&D&I Governance in the Czech Republic

*Key findings & recommendations*

*Erik Arnold & Bea Mahieu  
Technopolis Group*

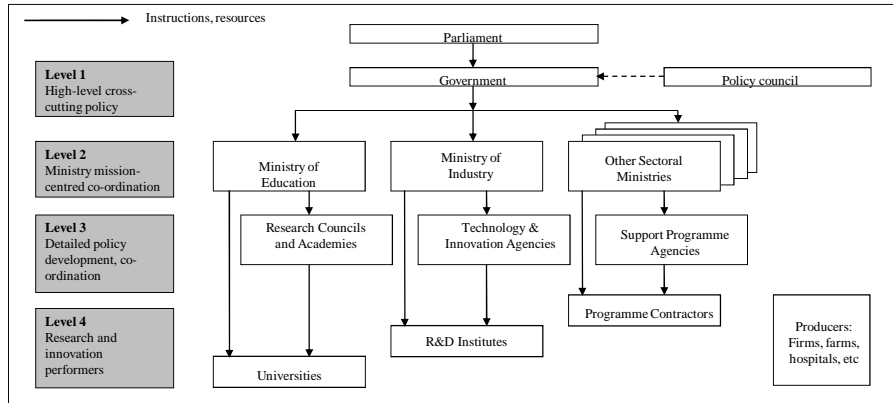
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## Principles of Good Practice for R&D&I Governance

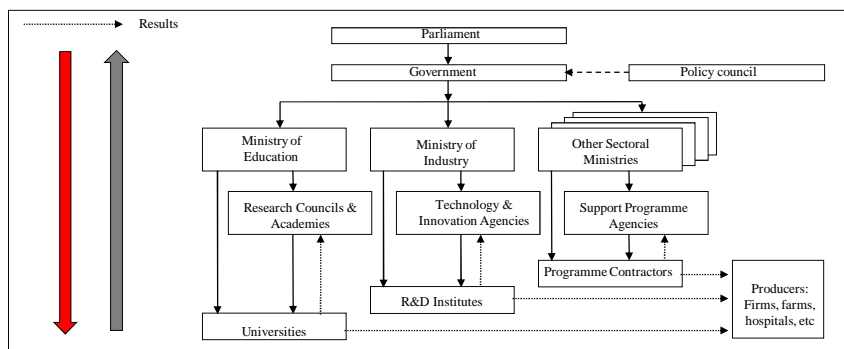
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## R&D Governance Structure



Governance has vertical & horizontal dimensions

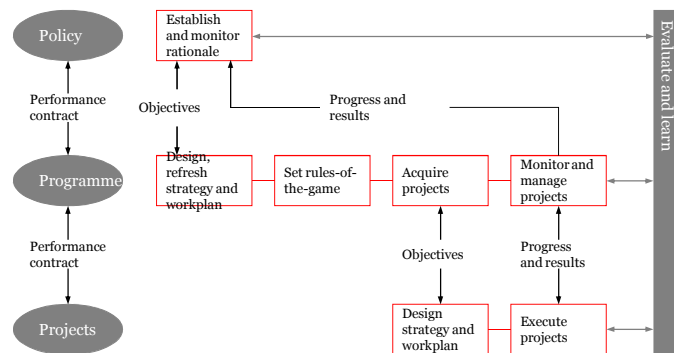
## Key axis = vertical steering (policy priorities)



**Logical consistency** of objectives across the programme cycle maximises the chances that interventions reach their objectives

- *Programme managers & project performers to achieve **policy goals***

## Generic policy cycle

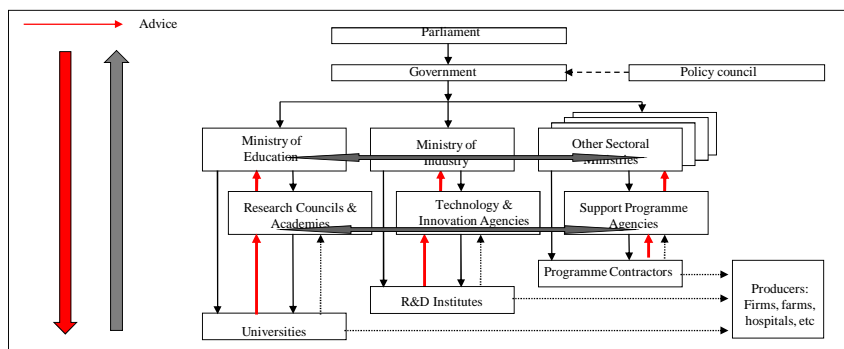


Clear **separation** between policy design & implementation

- *Use of performance contracts – clarity in goal setting & communication*

Focus of **programme design & evaluation** on goals and impacts

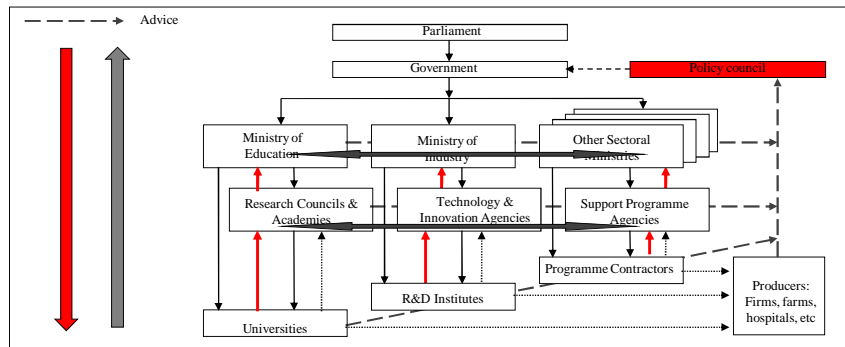
## Vertical & Horizontal Co-ordination



Distributed strategic intelligence

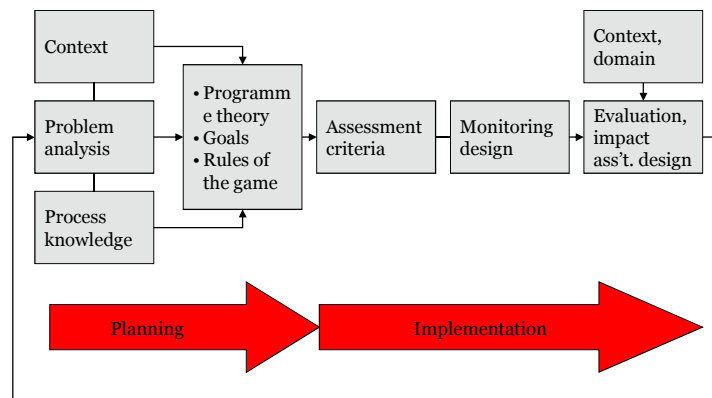
- *Governance carried out in concert by well-informed people & organisations at different levels*

## R&D Councils as co-ordinators & contributors of strategic intelligence

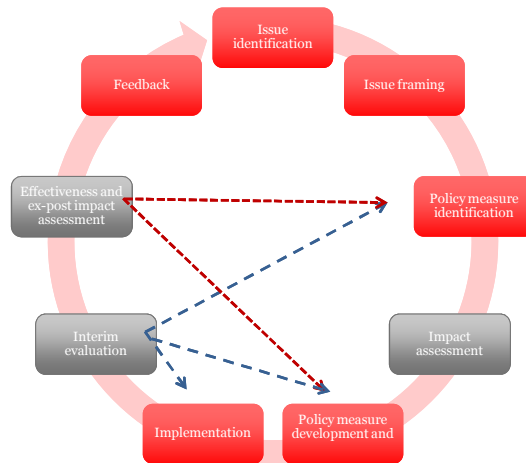


Open arena for discussing strategy & policy, creating consensus & promoting long-term strategies  
 Ensures policy co-ordination & influences but does not decide on budgets  
 Maintains high profile with the public & opinion fo

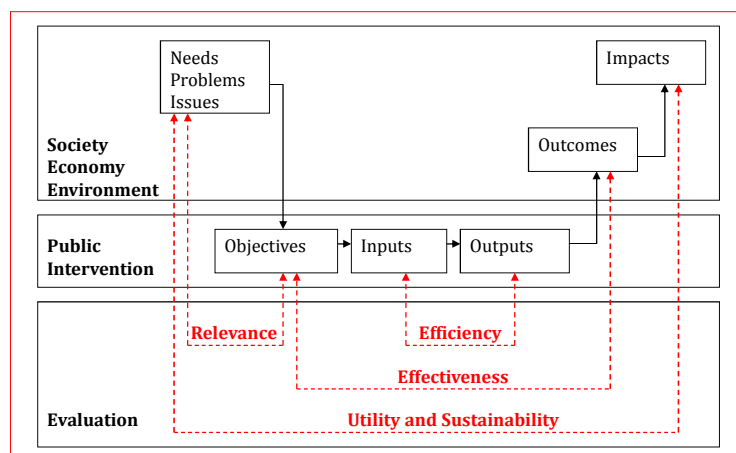
## Key theme: consistent use of knowledge



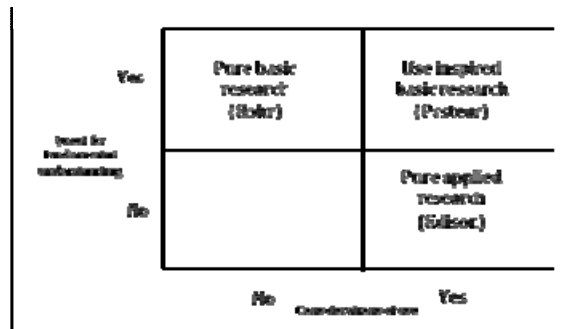
Evaluation **in general** should inform the whole policy cycle



Evaluation should tell you about the societal effects of intervention, not focus on outputs



## Basing policy on adequate models of research



Donald Stokes, Pasteur's Quadrant

Understanding & designing organisations & policy instruments that can cope with the **variety & interconnectedness of knowledge production & use**

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### Key Findings

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## Key findings on Czech governance

### Vertical steering:

- Fair consistency & coherence in policy priorities at the different R&D governance levels (multilevel thematic priorities)
  - *Some missing links between strategic concepts & programmes*

### Coordination:

- Increasing collaboration among research communities and institutions
- Increasing level of inter-ministry collaboration
- Strong involvement & use of stakeholders as sources for strategic intelligence at ministry/agency levels

### Conceptual gaps

- Over-simplified, outdated distinction between basic and applied research
- Evaluation as 'counting outputs'

## Evaluation Practice & the Role of Evaluation

- Generalised limitation of evaluation as uniquely a tool for accountability
    - *Evaluation culture dominated by the Evaluation Methodology for Completed Programmes (efficiency & outputs)*
    - *Evaluation in sense of evidence-based analysis of goal achievement (impacts) is little practiced*
  - Problematic implementation of evaluation (each level evaluates its own activities)
  - The concept of evaluation as intrinsically *part of the policy cycle* is not perceived
- Little input to policy learning or improvement of implementation in order to reach attainment of the objectives ("formative" evaluation)

### The two-pillar model

Pervasive conceptual division of research along the linear model: basic versus applied research (the “two-pillar” approach)

→ Disconnectedness & gaps in the system of R&D&I funding

Internationally, research funders move beyond these rigidities through the use of modern R&D funding instruments & good coordination

- Study & adjust disciplinary boundaries to respond to new, interdisciplinary opportunities
- Take a mixed response-mode & programmed approach
- Foster a mixture of more fundamental, applied and innovation-related research

### The Czech R&D&I Council is shifting from an advisory to an executive role as a ‘virtual science ministry’

- Under-estimation of importance of **consensus-building & open dialogue** with policy implementing bodies, stakeholders & citizens
  - *Culture of strong top-down steering & control of policy implementation*
- Setting up a long-term strategy, essentially **top down**
  - *Priority setting governed by the Council*
  - *Agencies to design and implement programmes*
  - *Weak links to sectoral policies*
- The approach to **strategic intelligence** is over-centralised and simplified
  - *Research and analysis outsourced, but not to stakeholders*
  - *Evaluation ‘automated’; provides little information about policy effectiveness*
- Focus on resource allocation means members become **representatives**
- The CR is **centralising and depersonalising decisions** – in other countries de-centrally & in trust-based partnerships with stakeholders
  - *Over-centralisation means there is too much for the Council to do to do it well*

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## Recommendations

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### General evaluation recommendations

- To adopt a **less mechanistic** and **more policy-orientated** use of evaluation
- To use evaluation methodologies that **look beyond outputs** and focus on the outcomes and impacts of projects, programmes, departmental policies and national policies – in line with common international practice
- Urgently to launch ex-post impact evaluation exercises of departmental and national policies in the light of the upcoming discussions for the development of the **National R&D&I Policy after 2015**

### Model of Research recommendations

To **move beyond the two-pillar model** for the funding of R&D&I and define the activities, scope and mode of funding in the Science Foundation and the Technology Agency along a more adequate model of research,

taking into account

- the growing role in modern science and research of fundamental application-oriented research
- the importance of creating platforms for the implementation of interdisciplinary research, and
- the value of bottom-up research funding – also in the context of applied research.

### R&D&I Council recommendations

To reform the R&D&I council to focus on consensus building and longer-term strategies

- Involves **all** institutional, research and industry stakeholder categories
- Coordinates and builds **consensus** on overall strategies - through decentralisation with dialogue-based soft steering and hard monitoring.
- Does **not micro-manage** - other state bodies should be responsible for the implementation of the overall strategies and fundamental principles, *also in relation to the national R&D&I funding allocation*

**Thank you**

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[erik.arnold@technopolis-group.com](mailto:erik.arnold@technopolis-group.com)

[bea.mahieu@technopolis-group.com](mailto:bea.mahieu@technopolis-group.com)

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## Review of the IPR System

Usage, framework conditions and support available for key actor groups of the Czech innovation system

*Conference Olomouc*

*April, 20 2011*

*WP d, iii*

*Alfred Radauer (Technopolis)*

*Juraj Poledna (Peritus)*

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## Aims and methodology applied

- Overview and an assessment of key elements of main elements of an IPR system:
  - *Legislation adopted on the topic of IPR*
  - *Usage and up-take of IPR by Czech industry and the scientific system and*
  - *Key policies, institutions and programmes/services in place to secure and foster qualified usage of IPR*
- Methodology
  - *Analytical reasoning*
  - *Secondary statistics on IPR up-take*
  - *Interviews with IP professionals and users of the IPR system (firms, universities)*
  - *International comparison*

### Some key facts

- The importance of IPR has been increasing
- IPR is more than patents
  - *Trademarks, copyrights, designs etc. as formal instruments*
  - *But also informal methods (e.g., trade secrets)*
- The IP management paradigm...
  - *Combining different formal and informal IPR instruments*
  - *in a context-specific way*
  - *to achieve commercial gains*
- ...requires considerable expertise (technical, legal, business, industry-specific)
- World-wide hopes on formal IPR-based technology transfer from science to industry are in many ways not met in practice

### Key findings (I)

- Low number of filings of formal IPR (but in line, even in the better performing group, of Eastern European countries)
- Reasons
  - *Traditions from communist times*
  - *Industry structure*
  - *IPR framework conditions (current design of the European patent system)*
  - *„Classic“ barriers such as costs or weak enforcement possibilities*
- But the most important barrier: Very low awareness in the system, especially at management levels
  - *Steep decline of know-how and interest levels once one gets aware of a core group of savvy experts*

## Key findings (II)

- Implications of the low awareness
  - *Low demand for intelligence from the core group of IP experts*
  - *Low networking among institutions and referral activities constitute another barrier*
  - *Service landscape*
    - Relatively well regarded patent office
    - Patent libraries with issues
    - Almost no support from chambers of commerce/business associations (!)
  - *Ambiguous design of incentive systems for better IPR usage in the research sector (output, rather than value oriented which hence provides numerous loopholes)*
  - *Some of the support programmes which provide funding for patenting seem to hang in the air*

## Key findings (III)

- The legal provisions are not an issue...
  - *All relevant international treaties have been signed*
  - *The Czech Republic in terms of legislation and legal enforcement provisions is ,strong' enough in that it performs better than countries such as Finland or Canada (according to the ,Special 301' report of the U.S.T.R.)*
- ...but there is big debate behind the curtains as to a possible ,shock' impact of the (pending) introduction of a unified Community Patent
- Education at Czech Universities on IPR is improvable
  - *but progress has been made*
  - *there may be even examples of ,elements of good practice' in the Czech Republic from which most other European countries can learn*



## Recommendations

- **Foster the creation of awareness in the system (!)**
- Create personal responsibility on IPR for the innovation system at ministry level (installation of an 'IPR representative')
- Define key tasks for the 'IPR representative'
- Re-consider the role of IPR in the evaluation system of publicly funded R&D and Act No. 211/2009

## Discussion points

- The role of competition law vs. IPR
- The Role of Act No. 211/2009
- Considerations as regards the EC's 'IP Code of Practice'
- The recommendations overall (and especially means to raise effectively and efficiently awareness on IPR in the system)

Thank you

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[alfred.radauer@technopolis-group.com](mailto:alfred.radauer@technopolis-group.com)

[juraj.poledna@peritus.sk](mailto:juraj.poledna@peritus.sk)

technopolis |group| has offices in Amsterdam, Ankara, Brighton,  
Brussels, Frankfurt/Main, Paris, Stockholm, Tallinn and Vienna

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## Research Evaluation and Institutional Funding in the Czech Republic

*Key Findings and Recommendations*  
*Olomouc, 20 April 2011*

*Barbara Good (Technopolis Vienna)*

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### Key Messages

- The Evaluation Methodology combines two functions:
  - *Evaluation of research*
  - *Decision-making about institutional research funding*
- The Evaluation Methodology does not reach international good practice in evaluating the quality of research
- Using the Evaluation Methodology as a basis for allocating institutional funding introduces significant threats and is likely to cause discontinuities. It is not appropriate to solve the problems of the Czech R&D&I system (productivity, quality, relevance)
- We recommend
  - *discontinuing the Evaluation Methodology*
  - *building a culture of quality development and evaluation*
  - *introducing a new system for the allocation of institutional funding based on a combination of performance contracts and a new balanced funding formula*

## The Evaluation Methodology's Strong Sides

- Strengths
  - *The idea of establishing a transparent system for allocating institutional funding*
  - *Sending a clear signal: „no outputs, no funding“*
  - *The idea of linking evaluation to decision making & policy making*
- Opportunities
  - *The EM breaks with an (unloved) past system (but so far without introducing an appropriate new system)*
  - *The introduction of the EM has caused a heated debate. This debate could be fruitful if it moved away from the particulars of the EM to issues like public institutional research funding and its purpose(s), missions and roles of different R&D institutions, research evaluation and evaluation culture etc.*

## The Evaluation Methodology's Weaknesses

- Reductionism
  - *Considers countable outputs only, ignores key factors influencing research quality & relevance*
  - *Looks at the past only, leaves no room for development*
- Does not address differences between disciplines sufficiently
- Does not address different types of organisations
  - *Different organisations have different missions & roles –> not all outputs are equally important for all organisations*
- Eligible outputs and their values are partly arbitrary
  - *The selection & definition of eligible outputs is problematic*
  - *In fact, the EM expresses implicit decisions about what kinds of research are considered important*

### The Evaluation Methodology's Threats & Risks

- Widespread opportunistic behaviour – 'playing the game'
- Unpredictability of institutional funding and instability of the research system due to large possible shifts  
→ Short-termism is encouraged, long-term thinking discouraged
- No room for improvement and capacity building – but these are key issues for R&D&I in the Czech Republic!
- Patching up the EM will not overcome the fundamental weaknesses
- Weak ownership – frustration and low morale threatens the CR as a location for R&D&I
- Using the EM within institutions exacerbates all problems

### Recommendations: Fundamental Ideas (1)

- Discontinue the present EM and build a new system **without** a **direct** link between the evaluation of research and decisions about institutional funding
- Stability: the necessary basis for planning
  - *Limit fluctuations in institutional research funding*
  - *Introduce multi-annual funding periods (difficulties known – and solvable)*
- Performance and Achievements
  - *Base institutional funding on proven past achievements and specified SMART performance targets agreed upon for the future*
  - *Do not use a peer review based system like in the UK for decisions about institutional funding – it is too costly*

### Recommendations: Fundamental Ideas (2)

- Transparency
  - *Combine formula budget and performance contracts*
  - *Formula: retrospective element*
    - Use a set of simple indicators, but more than just counting outputs
  - *Contract: prospective element*
    - A contract is not an intention – it is binding for both parties and will be monitored closely
    - Safeguards against nepotism to be put in place
    - The prospective element cannot be covered by project funding alone
  - *Evaluation of research quality: informed peer-review*
- Building institutional capacity for the new funding & eval. system
  - *Ministries and research organisations both need to learn how to implement performance contracts and how to evaluate research in a meaningful way*
  - *Share and learn from (inter)national experience*

### Recommendations: Fundamental Ideas (3)

- Different models of governance & funding for different types of organisations
  - *Different types of research institutions have different missions, different targets, different roles and different tasks - evaluation and funding needs to be in line with organisations' missions*
  - *Blind spot in the discussion so far?*
  - *The new funding system needs to account for this*
- Evaluation as a tool for learning and institutional development
  - *Do not translate research evaluation 1:1 into a funding decision between ministries and research organisations*
  - *Use research evaluation to **inform** decision making and institutional development*
  - *Build a culture of 'quality development' and make evaluation a valuable tool in this context. This can e.g. be one stipulation in a performance contract.*

Thank you

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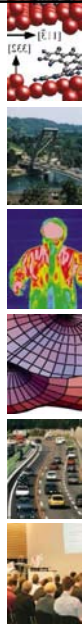
Contact:

Barbara Good: [barbara.good@technopolis-group.com](mailto:barbara.good@technopolis-group.com)

Brigitte Tiefenthaler: [brigitte.tiefenthaler@technopolis-group.com](mailto:brigitte.tiefenthaler@technopolis-group.com)

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Brussels, Frankfurt/Main, Paris, Stockholm, Tallinn and Vienna

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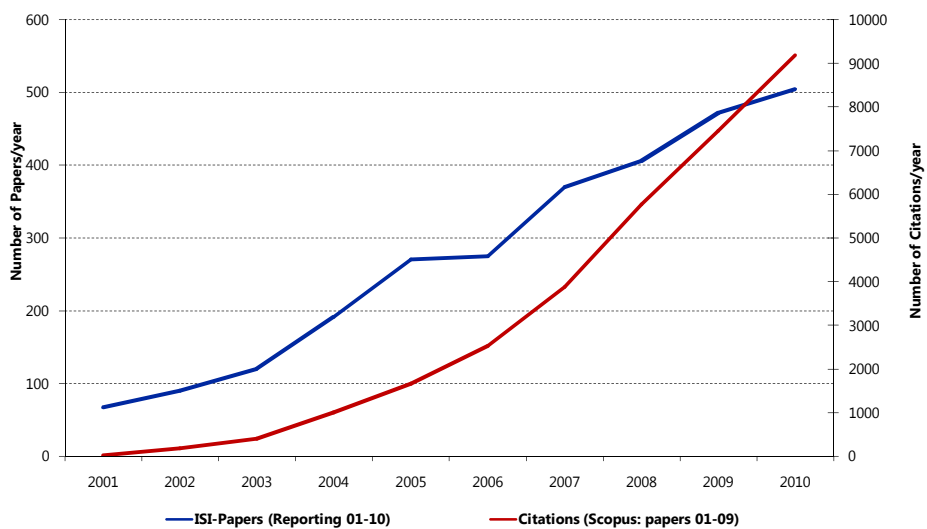


Materials Science & Technology

## EMPA 2001-2010, from a Materials Testing to an internationally visible Materials Science & Technology Institution

**Louis Schlapbach**, Dr.sc.nat ETH, Prof.em. Physics ETH  
Director Empa 2001-2009

### Development 2001-2010: Citations and Publications

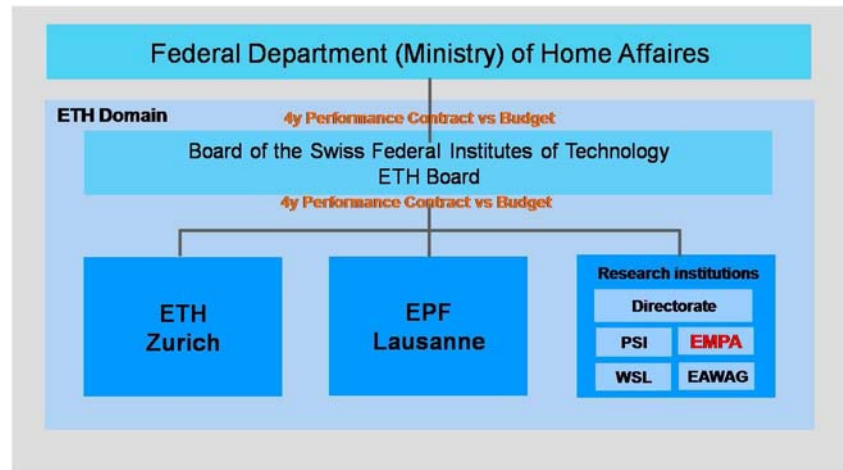


Materials Science & Technology



## The System: ETH Domain, Switzerland

### Organizational chart



## Some Decisions of the ETH Board

- 1986 «EMPA - Swiss Federal Lab for Materials Testing and Research»
- **Portfolio & Performance 1990-2000: Civil & Mech Engineering, Materials Engineering, 5 PhD students, 50 publications and 400 reports per year, known by industry for testing, not respected for academic performance**
- 1999/2000 ETH Board seeks for a new **Director (a scientist)** to **transform Empa into a modern *Materials Research Institution***
- 2001 New Director is asked to improve the scientific performance  
to adapt the organizational form to ETH standards  
to adapt and focus the portfolio
- 2002: Same budget relevant **indicators** for all 6 Institutions: **Publications, PhD Students, 3rd Party Means, Professors, Teaching, Patents & Licences**.
- 2003 ETH Boards «Strategic Planning 2004-07» confirms „Transition to a Research Institution, Closer to Schools, Portfolio Amendments, Common Professorships with Universities“
- 2004 «**Top-notch research in selected topics of high societal relevance**» is the main task of the Research Institutes according to the ETH Board Document «Future of RI»

## Tools for the change management (all internal)

- Mission, Vision, Portfolio
- Research & Innovation Promotion, Research Commission  
budget for series of internal research projects
- Organization
- HR: Recrutement Lab-leaders are active scientists or engineers
- Performance Contract vs Budget Allocation  
4y Working Plan, Annual Performance Contract vs Budget  
at least 1 annual visit of all Laboratories by Director and Dept.Head
- Empa Academy
- Annual Empa Awards: *Research, Innovation*
- Valorization, IPR, Transfer, Marketing, Spin-off's
- Communication: internal, ETH-Domain, national/international



## Strategy for R&D institutions/projects/teams in the national and international context

The institution/project/team will **fulfill/contribute to the needs** of economy, society and environment, especially of the country. They set priorities of work in **Use Inspired Research, R&D, Services, and higher Edu** according to

<b>Attractivity</b>	for	<b>Economy / Industry / Innovation Society Environment Science</b>
<b>Feasibility</b>	following	Complementarity to university offers critical mass, financement, brain power
and develops its		
<b>Strength</b>	through	Interdisciplinarity full chain of steps from Use Inspired Research to prototype efficient transfer thanks to proximity to industry competent longterm staff members excellent park of instruments and tools

**Mission:**

Empa is a platform which bridges  
materials science and technology for  
**Research** innovation in industry **Services**  
and quality of life of the society.  
**From visions to reality.**

**Teaching**      **Engineering Transfer**      **Continuing Edu**  
                          **Innovation**

*Safety/security, reliability/risks and sustainability are cross-sectional themes*

**EMPA**  
Materials Science & Technology

**R&D: Carbon nanotube cold electron sources**

**Field Emission Display with SONY (Japan)**

**X-Ray tubes COMET AG (CH)**

**Science & Technology**

**Engineering: Large Structures, C- fibre reinforcement, dynamics&damping**

**Services: Failure Analysis / Continuing Education**

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## Empa's Portfolio

### ■ Use inspired research

- Nanotechnology
- Materials science and technology
- Environmental science and technology

### ■ Engineering R & D

- Civil and mechanical engineering
- Environmental technologies
- Measuring techniques, instrument development

### ■ Education

- Teaching @ academic institutions 3000 h/y
- Teaching @ HES / FHS 500 h/y
- Continuous education Empa Academy 6000 p/y



## Empa's Portfolio, cont.

### ■ Technology – Society

- Risks, Nanotoxicology
- Life cycle analysis, ecoinvent database
- (Non)Sustainability of Biogenic Fuels

### ■ Technology Transfer, Portal

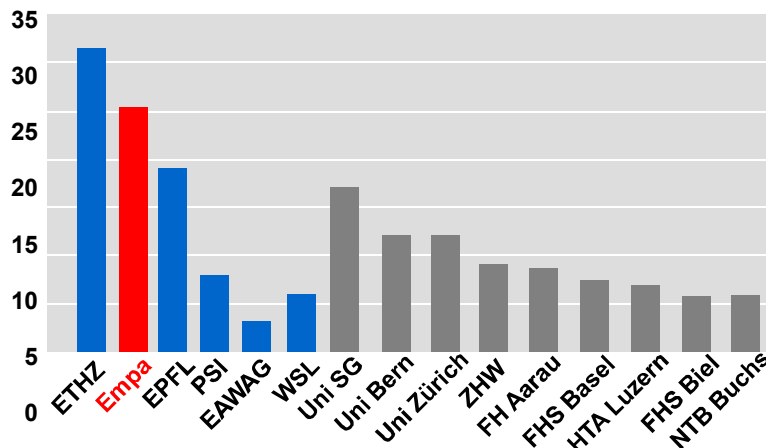
- Business Incubators St. Gallen, Dübendorf
- Consulting, Patents
- Marketing

### ■ Services

- Neutral expertise
- Failure analysis
- Ressortforschung



## KOF ETH Survey: Contacts between Swiss Industry and Public Education and Research/Development Institutions



## Research Commission Empa

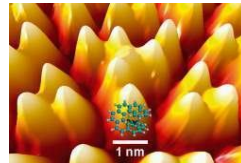
**FOKO A (internal)**  
Dr. P.A. Gröning,  
Dr. E. Hack  
Prof. L. Hilty, Dr. K. Maniura  
Dr. B. Lothenbach,  
**Prof. L. Schlapbach**

**FOKO B (national)**  
Prof. Jürg Dual, ETHZ,  
Prof. T. Egli, EAWAG  
Dr. K. Knop, CSEM,  
Prof. NN, ETHZ/EPFL,  
Prof. V. Vogel, ETHZ,  
Prof. A. Wokaun, PSI

**FOKO C (international)**  
**Prof. K. Müllen, MPI, Germany**  
Prof. H. Einstein, MIT, USA  
Prof. Bengt Kasemo, Chalmers, Sweden  
Prof. T. Kishi, NIMS, Japan  
Prof. E. Leppävuori, VTT, Finland  
Prof. Y. Petroff, ESRF, France  
Prof. C. Stürmer, Konstanz, Germany

## Empa's Research Programs (Empa internal decision)

### Materials for Health & Performance

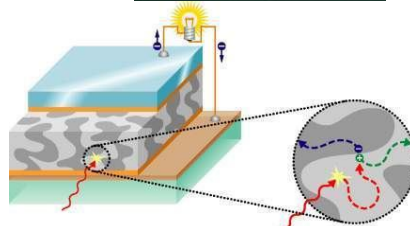


Nanotechnology

### Adaptive Material Systems



### Natural Resources and Pollutants



Materials for Energy Technologies



Materials Science & Technology

## Organizational Chart 2008



Materials Science & Technology

### Research Programs

Nanotechnology Prof. Dr. Peter J. Flory	Adaptive Material Systems Prof. Dr. Thomas G. Mason (with an associate professor in the US)	Materials for Health and Performance Prof. Dr. Thomas G. Mason	Natural Resources and Pollutants Prof. Dr. Thomas G. Mason	Materials for Energy Technologies Prof. Dr. Thomas G. Mason
--------------------------------------------	---------------------------------------------------------------------------------------------------	-------------------------------------------------------------------	---------------------------------------------------------------	----------------------------------------------------------------



Federal Office for the Environment  
FOEN  
Mattenstrasse 51  
3003 Bern  
Phone: +41 31 450 11 11  
www.bafn.ch

### FOEN Management

Director General  
Prof. Dr. Hans-Joachim Löhner

Deputy  
Dr. Hans-Joachim Löhner

Empa Director  
Prof. Dr. Thomas G. Mason

### Research Programs

Advanced Materials and Surfaces Dr. Thomas G. Mason	Civil and Mechanical Engineering Dr. Thomas G. Mason	Materials and Systems for the Protection and Wellbeing of the Human Body Prof. Dr. Thomas G. Mason	Information, Reliability and Simulation Technology Prof. Dr. Thomas G. Mason	Mineralogy, Energy and Environment Prof. Dr. Thomas G. Mason	Support Prof. Dr. Thomas G. Mason
<b>LABORATORIES</b> High Performance Composites Dr. Thomas G. Mason Functional Polymers Dr. Thomas G. Mason Nanotechnology Dr. Thomas G. Mason Materials for Health and Performance Dr. Thomas G. Mason Materials for Energy Technologies Dr. Thomas G. Mason Materials for Natural Resources and Pollutants Dr. Thomas G. Mason	<b>LABORATORIES</b> Mechanical Systems Engineering Prof. Dr. Thomas G. Mason Mechanics for Modeling and Simulation Prof. Dr. Thomas G. Mason Structural Engineering Prof. Dr. Thomas G. Mason Welding Prof. Dr. Thomas G. Mason Building Technology Prof. Dr. Thomas G. Mason Construction Technology Prof. Dr. Thomas G. Mason Road Engineering/Building Components Prof. Dr. Thomas G. Mason	<b>LABORATORIES</b> Protective Gas and Physiology Prof. Dr. Thomas G. Mason Advanced Fibers Prof. Dr. Thomas G. Mason Interfacial Adhesion Interactions Prof. Dr. Thomas G. Mason Biomaterials Prof. Dr. Thomas G. Mason	<b>LABORATORIES</b> Technology and Society Prof. Dr. Thomas G. Mason Media Technology Prof. Dr. Thomas G. Mason Simulation / Modeling / Reliability Prof. Dr. Thomas G. Mason Accuracy / Noise Prevention Prof. Dr. Thomas G. Mason	<b>LABORATORIES</b> Natural Resources and Environment Prof. Dr. Thomas G. Mason Air Pollution Prof. Dr. Thomas G. Mason Analytical Chemistry Prof. Dr. Thomas G. Mason Solid State Chemistry and Catalysis Prof. Dr. Thomas G. Mason Hydrogen Energy Prof. Dr. Thomas G. Mason	<b>LABORATORIES</b> Marketing, Knowledge and Technology Transfer Prof. Dr. Thomas G. Mason Environmental Science Prof. Dr. Thomas G. Mason Human Resources Prof. Dr. Thomas G. Mason Information Prof. Dr. Thomas G. Mason Finance/Controlling/Purchasing Prof. Dr. Thomas G. Mason Methods of Engineering/Working Prof. Dr. Thomas G. Mason Logistics and Infrastructure Prof. Dr. Thomas G. Mason Communication/Research Institute Prof. Dr. Thomas G. Mason

### Public-private Partnerships

Reliability Network Prof. Dr. Thomas G. Mason	Centre for Sustainable Structures Prof. Dr. Thomas G. Mason	Technology Center for the Construction Industry Prof. Dr. Thomas G. Mason	Technical Institute Prof. Dr. Thomas G. Mason
--------------------------------------------------	----------------------------------------------------------------	------------------------------------------------------------------------------	--------------------------------------------------

### Programs for Education and Continuous Training

Empa Academy Prof. Dr. Thomas G. Mason	International PhD School Prof. Dr. Thomas G. Mason	Master's Program in Micro and Nanotechnology (MNT) Prof. Dr. Thomas G. Mason
-------------------------------------------	-------------------------------------------------------	---------------------------------------------------------------------------------

# Interdisciplinary R&D work by matrix type combination of the departmental structure with Research Programs, completed by training, communication and marketing

**Dialogue: COMMUNICATION**

**Research Departments**

- Advanced Materials and Surfaces
- Civil and Mechanical Engineering
- Materials for the Protection of the Human Body
- Mobility, Energy and Environment
- ICT, Reliability, and Simulation

**Support Department**

**Quality: RESEARCH COMMISSION**

**Research Programs**

- Nanotechnology
- Adaptive Materials
- Materials for Health and Performance
- Natural Resources and Pollutants
- Materials for Energy Technologies
- Services
- Teaching

**Training: ACADEMY**

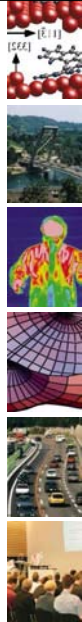
**Gortal**

**Marketing, Knowledge Management and Technology Transfer**

**EMPA**

Materials Science & Technology





## HR: Creativity or Duty?

*some thought for lab-leaders  
and young scientists*

### *to staff:* **Driving Forces in R&D**

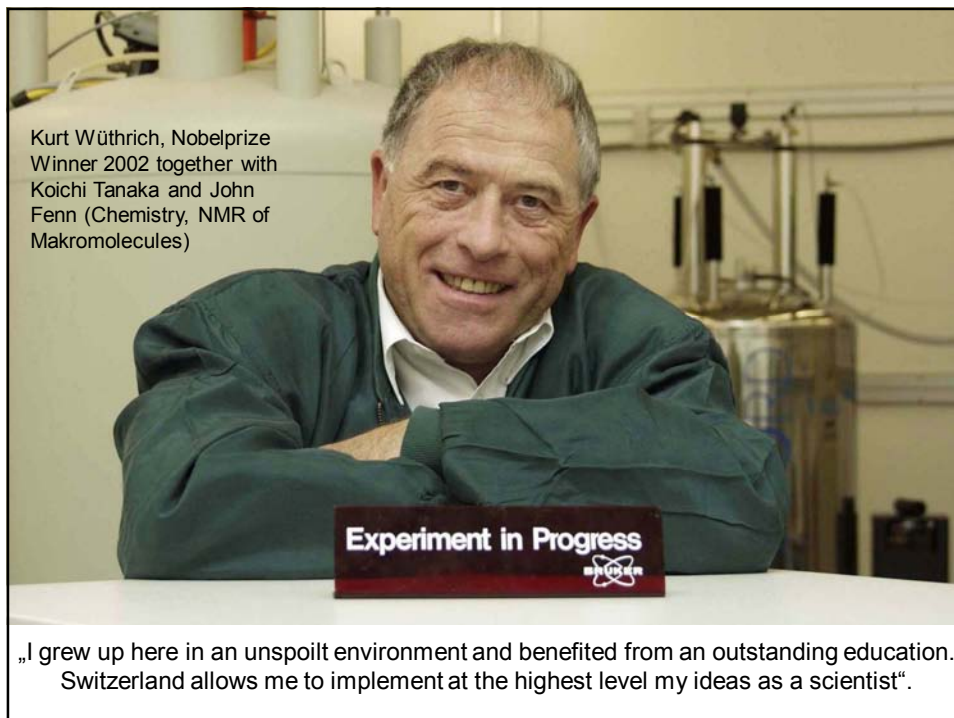
- **Curiosity** / **Creativity** of individuals and society
- Ambitious and hungry for knowledge and understanding
- Courage, envie or pressure to solve problems
- Innovation, economic needs for innovation
- Needs, ambitions for leadership
- Ambition to make profit/money, create jobs



*to Board and staff:*

**Create and maintain a climate and culture for R&D and innovative thinking and behaviour**

- Room for discussion
- Time to read - new results from fundamental research, from other disciplines
- Time to think
- Time to exchange ideas with other scientists and engineers
- Value that your brain does not follow 8 – 17h
- International collaboration with selected partners
- Exchange of knowledge, culture: sabbaticals, guests
- Lean administration



*to Board and Staff:*

## Goals of Quality Management

- Recruit the best person
- Recruit the best person
- Recruit the best person
- Create a stimulating atmosphere
- Develop a good research climate
- Offer continuing education to coworkers on all levels
- Project work with clear focus and milestones
- Benchmark: compare quality and quantity of results at an international level
- Minimal administrative and control work

*to Board and Staff;*

## **Begin** and end of a new R&D activity

- Problem identified, customer/partner expects solutions
- *Creative* Person has realistic idea for solution
- Form an interdisciplinary team of experts, not only members of the future team
- Critical evaluation of the ideas. Decide for the most realistic one
- Collect the own knowledge
- Integrate the international knowledge
- Advantages/risks to try to reach the goal faster in collaborative effort
- Who is 'competitor', which goals and solutions did he choose?
- Formulation of the project with goals, solution path and milestones, Contingency plans
- Identify tools, equipment and resources (own or in collaboration)
- Financial security
- Fix ideas and duties for KM and TT of the results

## Begin and **End** of an R&D Activity

- Problem solved
- Problem lost its original significance
- Scientists/engineers are burnt out
- No chance to remotivate scientists/engineers
- The engaged employees are not *creative* enough
- Solution path turned out to be wrong

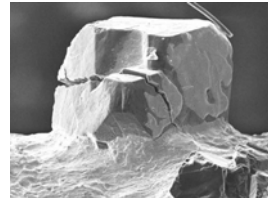
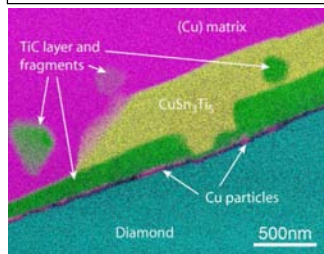
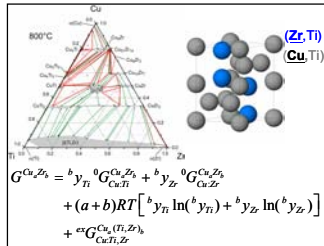
*to Staff and Board:*

### **Negative judgement in the scientific world of application oriented research**

- Number of publications in reviewed scientific journals (ISI) over 2 years are too low (in many fields 1 publication per year and scientist is a good measure)
- Budget per publication of reviewed paper exceeds 150-200 kEuro
- The research team produces more non-reviewed than reviewed publications
- Other scientists/engineers are not interested in the published results, no/low citation rate
- The research team spends large amounts for travelling/conference attendance, but has no chance to give invited talks
- The research team is not successful in competitive budget allocation (internal, NSF, EU-FP, CTI, ...)

### PhD Formation, Example of Incentives: Annual Empa Research Award 2007 Chunlei Liu (PhD-student)

- **Objective:** Characterize and model interface reactions between diamond and Cu-Sn-Ti brazing filler metals (tools: SEM, TEM and CALPHAD, DICTRA)
- **Approach:** Thermodynamic calculation and kinetic simulation + key experiments
- **Potential:** Better understanding of microstructure evolution during active brazing
- **Goal:** Increase life-time of diamond tools by using optimized brazes + process parameters



**EMPA**  
Materials Science & Technology

### Empa Innovation Award

Purpose: Promoting and honouring (CHF 5000) the transfer «from science to business»

The applications are evaluated by a panel of experts from industrial entrepreneurs and technology transfer specialists from Empa

The winner 2006: Dr. Felix Weber and his team, awarded for their very successful project «Controlled damping of cable-stayed bridges»



«Franjo Tudjman Bridge» near Dubrovnik, Croatia



Dr. Felix Weber

the partner from industry:



**MAURER SÖHNE**  
Innovationen in Stahl

**EMPA**  
Materials Science & Technology

## Continuous Formation at Empa Academy

Top Empa-Colloquium Speaker:

*Peter Atkins: 'Galileo's Finger'*

(The laws of thermodynamics in chemistry and physics)



## Empa-Portal – Easy Access to Empa



- Single-point-of-contact for new partners
  - access to experts
  - introductory meetings
  - solution provider for interdisciplinary problems
  - pro-active approach
  - supporting laboratories (meetings, trade shows)
- Initiated in 2006
  - YTD over 400 requests in 2008 (500 in 2007)
  - today ca. 1-2 meetings p/week

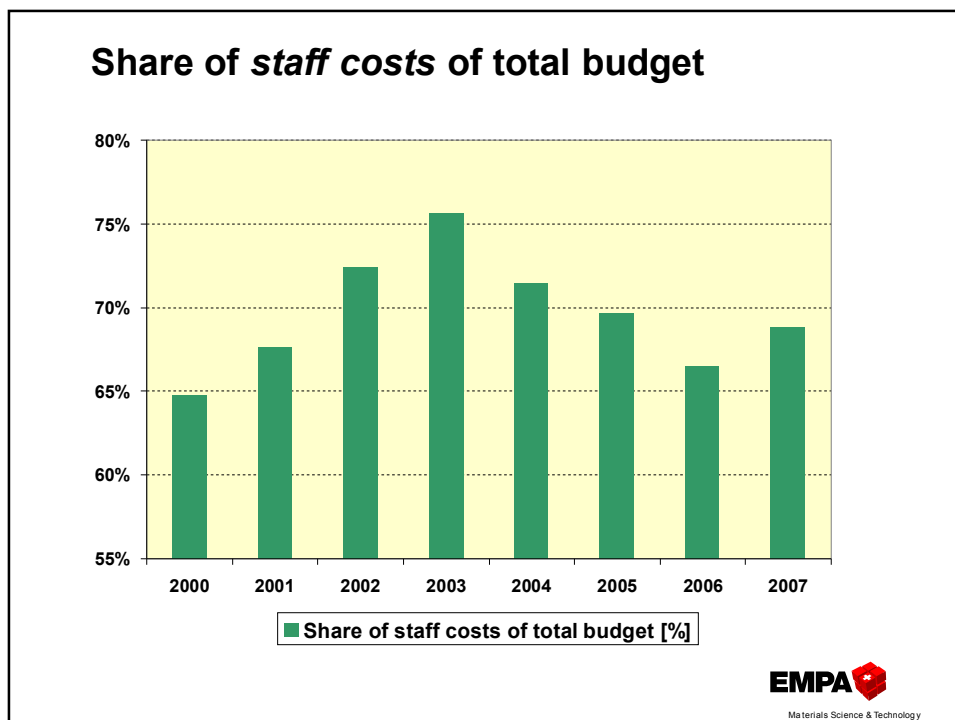


## Empa's Multidisciplinarity Approach

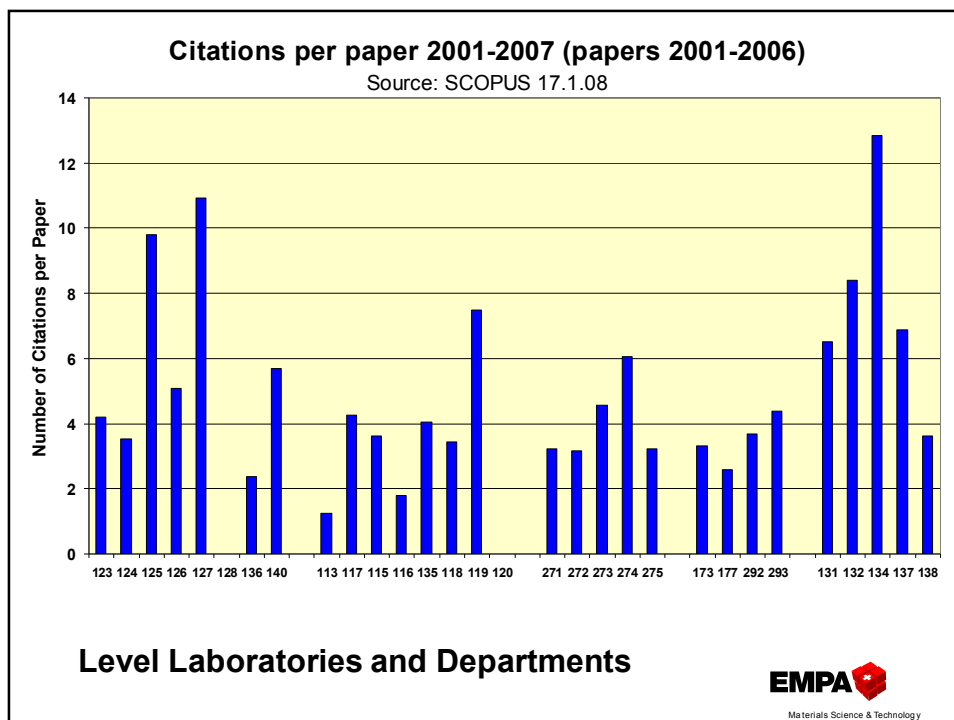
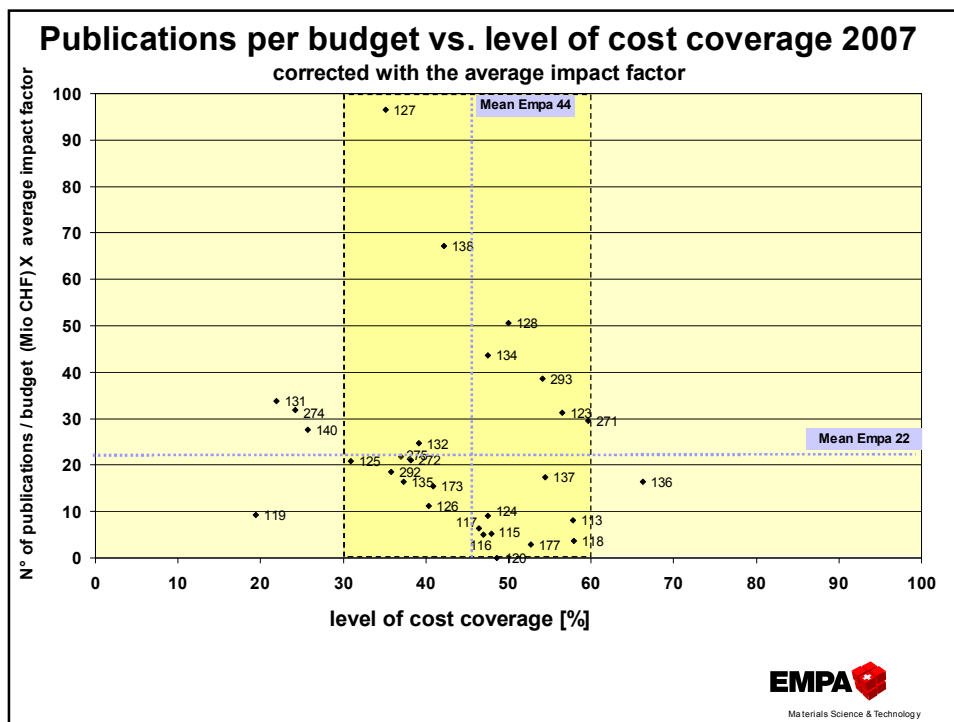
**nano CONVENTION**  
28./29. JUNI 2007, BERN

300+ attendees from various disciplines such as:

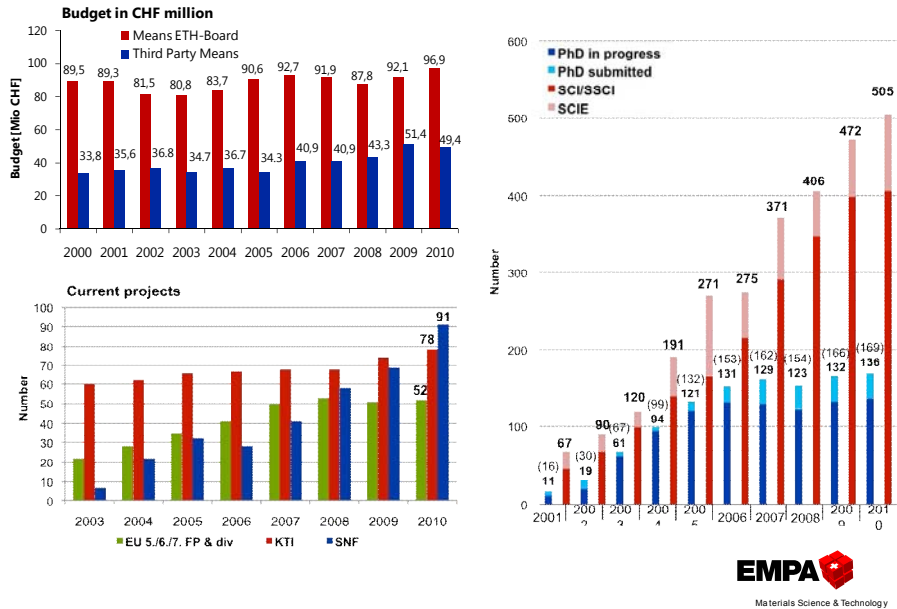
- Science / research & education
- „Nano-industry“ & trade associations
- Banks, investors, insurance companies
- Federal authorities / administration
- Technology assessment / philosophy

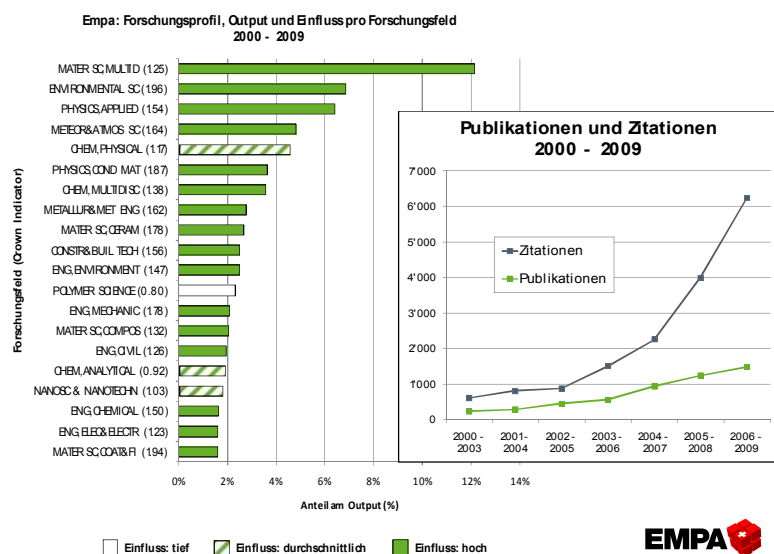




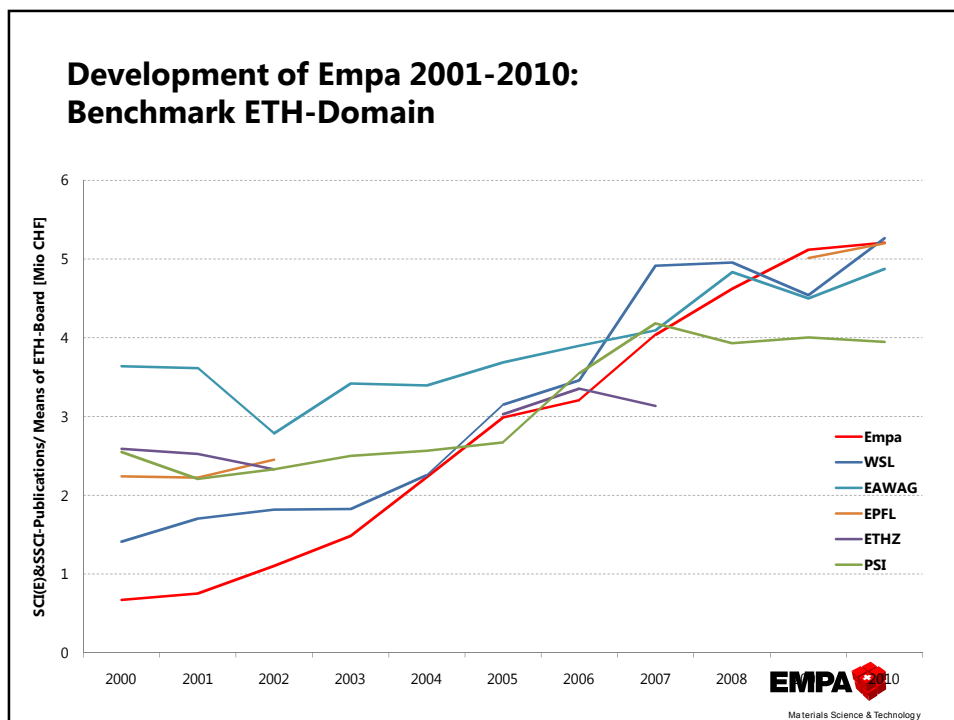
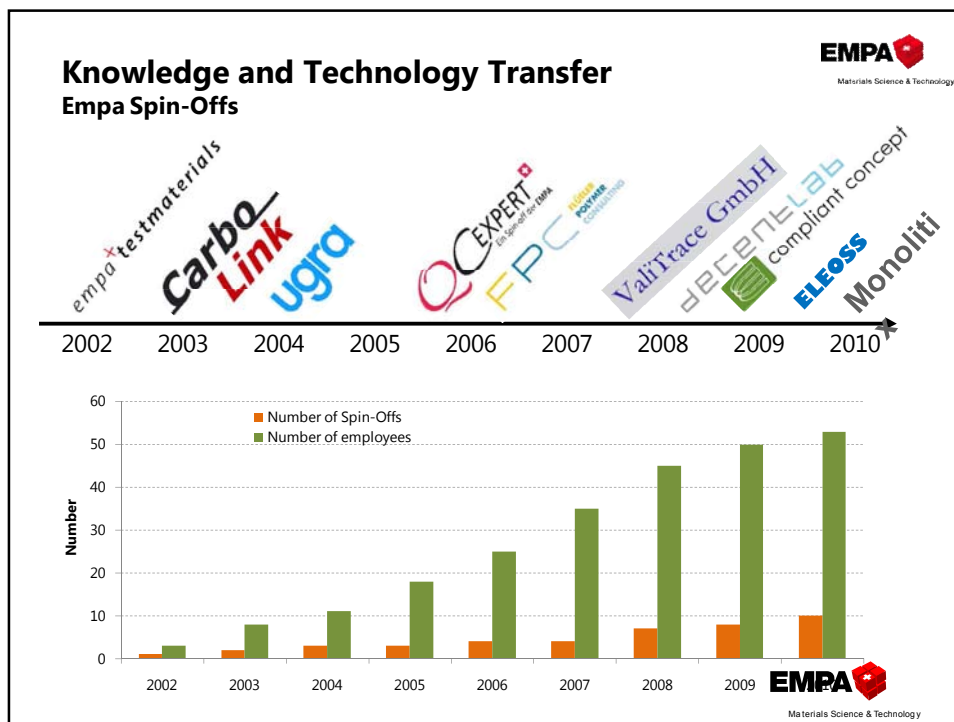
## Development of Empa 2000 – 2010



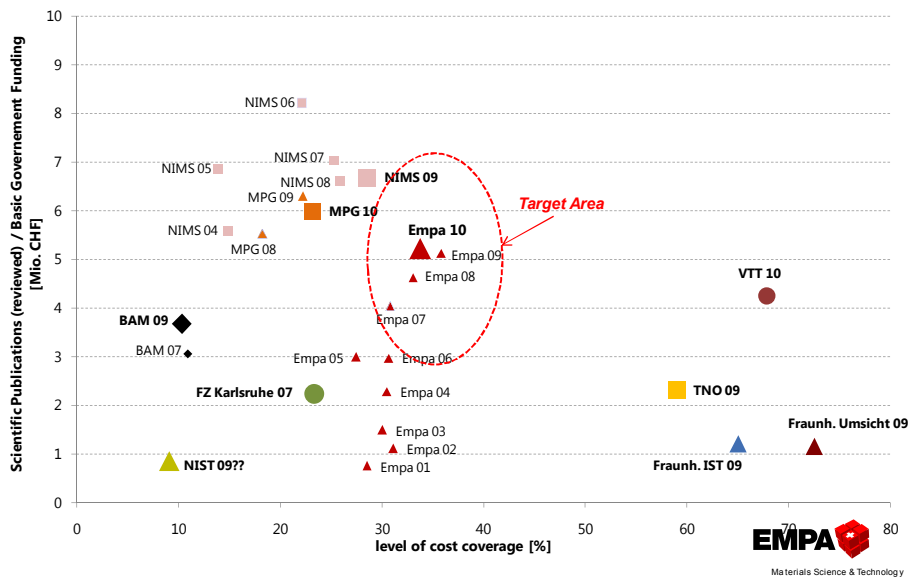
## Bibliometrie: Resultate der CWTS-Studie







## Development of Empa 2001-2010: International Benchmark



## Successful Processes

- Internal R&D Project Series (2 Mio CHF/y): **Culture**
- Working Plans (4y) of the Laboratories: **Focus, Proposal Writing, Benchmark**
- Laboratory-Performance Contract vs Budget: **Leadership, Competition, Finance**
- Annual Lab-Visits by Director and Dept-Head, : **Lead, Portfolio, Quality Control, Finances**
- 5 Research Programs: **Portfolio, Interdisciplinary Work**
- Research Commission: **Quality**
- Recruiting: **Heads of Laboratories as Leaders of Science & Engineering**
- Academy: **Continuous Formation, Culture**
- Portal: **Marketing, Consulting, Visibility**
- Communication (Activity Report, Empa News, ...): **Visibility**
- PhD formation, Research Award, Innovation Award: **Formation, incentives**
- National and international collaboration



## R&D Expenditures in the Czech Republic and Abroad

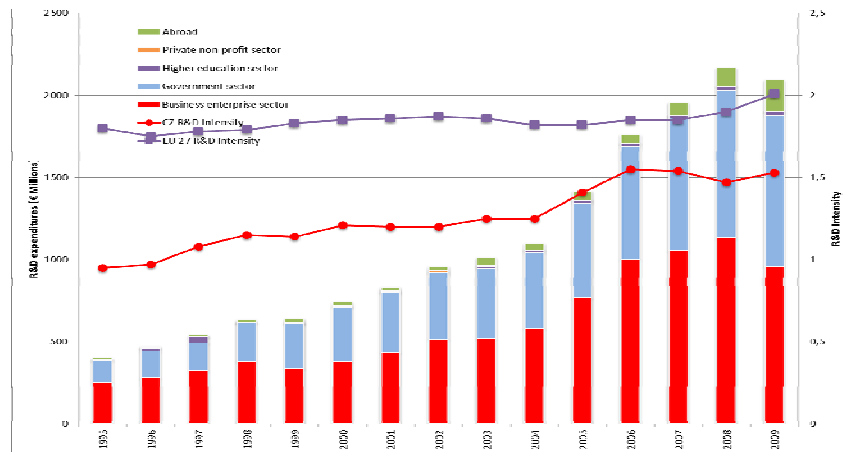
*Michael Dinges*  
*Joanneum Research*  
*Centre for Economic and Innovation Research*  
*[michael.dinges@joanneum.at](mailto:michael.dinges@joanneum.at)*  
*+43-1-5817520-2813*

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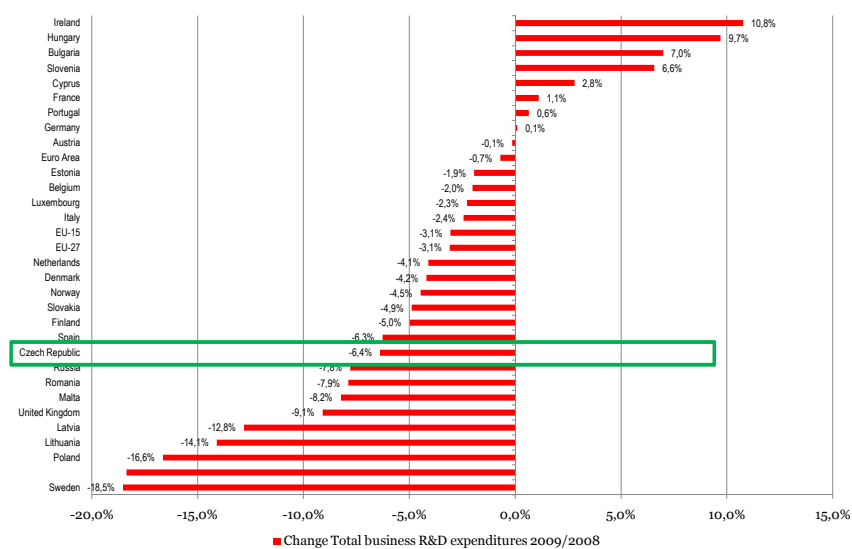
### Main tasks

- Assessment of public expenditure for RTDI in the Czech Republic: effectiveness and comparability with the European level
- Level of public RTDI financing
  - *Targeted and institutional financing*
  - *Level of basic and applied RTDI in different types of institutions*
  - *Total amount of public and private funding of RTDI*
- Diversification of financial support
  - *Funds allocated to individual research fields*
  - *Adequacy of priorities with regard to conditions in the Czech Republic*
  - *The impact of building new capacities within the OP for RTDI*
  - *Existence of critical masses within industry and research*

## Development of R&D financing in the Czech Republic



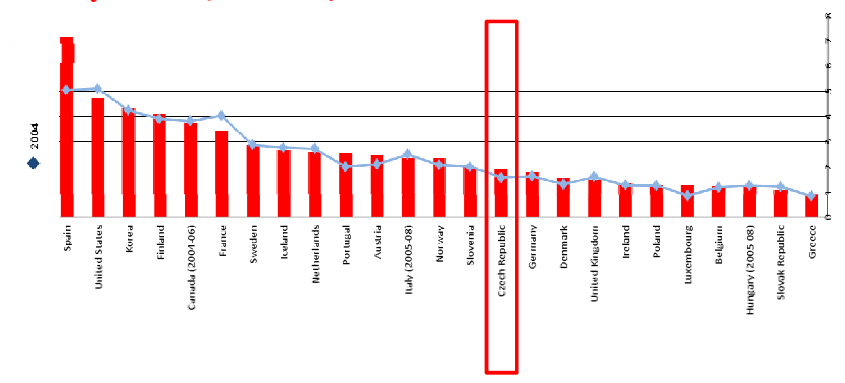
## The impact of the global economic crisis on business R&D



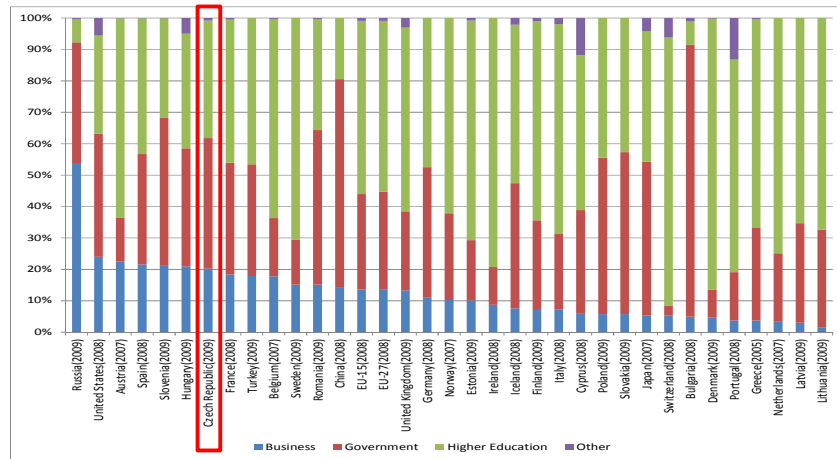
## R&D financing in the Czech Republic

- Well balanced increase of RTDI financing:
  - 15-years of catching up, showing a constant increase of public R&D investments, and an abrupt decrease of Business R&D investments due to the economic crisis
- RTDI financing structure in different performance sectors comparable to those of well advanced EU economies, with some distinct features:
  - Relatively high shares of public R&D support in business enterprise sector (13%)
  - Relatively low shares of R&D financed by industry in higher education sector (1%)
  - High levels of licences income in the Academy of Sciences, due to revenues stemming from a limited nr. of licences (13%)
- An increased internationalisation of R&D financing
  - In the **Business Enterprise Sector**, R&D investments from abroad have increased by 240% since 2007 in absolute terms, accounting for 13% of R&D expenditures in this sector in 2009
  - In the **Higher Education Sector** and the **Government Sector**, an increase of 9% since 2007, and 20% is largely to be attributed to EU financing, the shares of 4.25% and 3.75% are still below EU-average levels

## Government R&D expenditures as % of total government outlays (2004 vs. 2009)



## Distribution of public R&D expenditures to different performance sectors

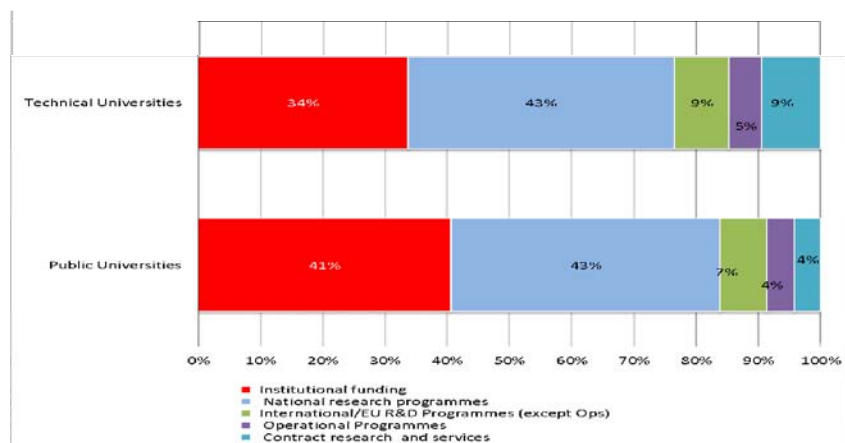


## Institutional Financing vs. Project Financing

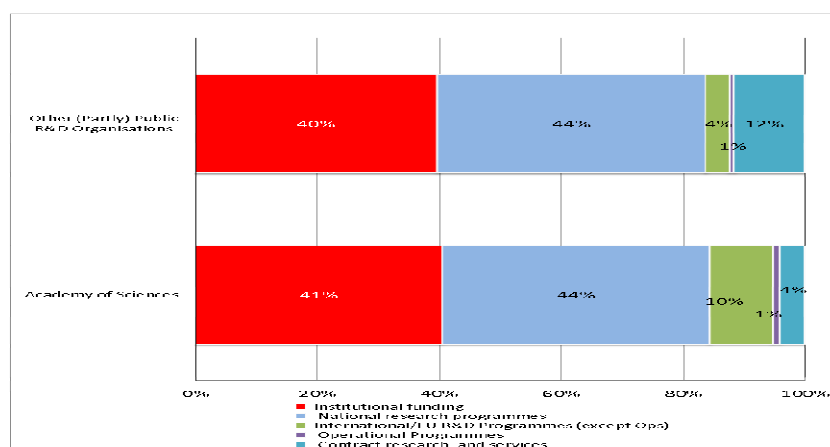
No clear international best practices, but a general trend towards more „project financing“.

- The overall level of project financing in the Czech Republic is already relatively high in the Czech Republic:
  - Target to reach a 60:40 ratio 'targeted'/institutional funding by 2015, has been met already: Institutional funding accounts for 38% of the total national R&D&I budget, targeted funding for 51%, and International co-funding for 10%.
  - In Austria, France, Italy, Norway project financing is in between 20% and 40% of total government R&D expenditures (Lepori et. al 2007)
- Large differences between different types of organisations:
  - Higher Education Sector: approx. 40% of project financing
  - Government Sector: approx. 45% of project financing
  - Business Enterprise Sector: approx. 83% project financing
- Researcher have a very different point of view:
  - Project financing as the main source for R&D activities

## Financing structure of the Higher Education Sector



## Financing structure of the Government Sector





## The R&D instrument portfolio

- Overall little emphasis on thematic priority setting within the portfolio of new programmes, except from
  - *ALFA and TIP: strong focus on „results oriented R&D“ with the risk of duplication of efforts*
    - ALFA: New technologies, materials and systems, energy development, transport
    - TIP: New materials and products, new technologies, new information and controlling systems
  - *Branch programmes of various ministries*
- Programmes by large missing from the portfolio:
  - *Measures focussing on human resources and young researchers*
  - *Measures focussing on science-industry linkages*
  - *Measures focussing in particular on social sciences and humanities*
- Operational programmes: Portfolio by large complementary to national research programmes, strong focus on new RTDI infrastructures and networking activities

## Conclusions

- The current division of state support between the different actors is within the normal range seen in other European countries:
  - *Today, a fairly stable amount of research resources for the Academy and the HEIs, of which some have been transformed to research universities.*
  - *An increased cooperation between the two types of organisations should be further supported, in order to make best national use of resources by exploiting the mutual strengths of the two systems.*
- The share of targeted R&D funding vs. institutional funding should not further be increased
  - *Costs, time for planning, evaluation procedures*
- The state needs to put additional resources into areas that will support newer and faster-growing branches
  - *Manufacturing and engineering research will continue to be needed, but there is limited state effort on life sciences and other areas such as Information Technology.*
- Increased efforts should be devoted to funding instruments and other measures that encourage business R&D in strong co-operation with academia, especially in larger companies and multinationals.
  - *Science-Industry linkages are just an add-on to national R&D programmes, no coherent strategy in sight*



  
 University of Twente  
*The Netherlands*

## Human Resources for R&D&I in the Czech Republic


Preliminary major findings and recommendations  
from Work Package (f) of the International RDI  
Audit


It's all  
about  
the  
people!



Olomouc  
20 April 2011

***Liudvika Leisyte and Jon File***

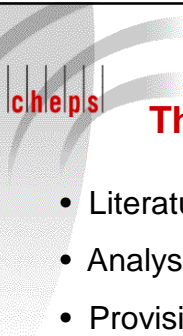


  
 University of Twente  
*The Netherlands*


## 6 “sub-work packages”

1. Issues related to the career structures for researchers
2. Issues relating to researcher mobility between institutions, sectors and internationally
3. Issues related to doctoral education and training
4. Issues relating to the HR challenges of new RDI fields and the major new investments in research facilities
5. Issues relating to concentrating human resources in RDI including co-operation between research institutions and industry
6. Examples of European good practice in the five areas above

In this presentation we will attempt an integrated analytical  
 overview of the *major preliminary* findings and  
 recommendations of these sub-work packages



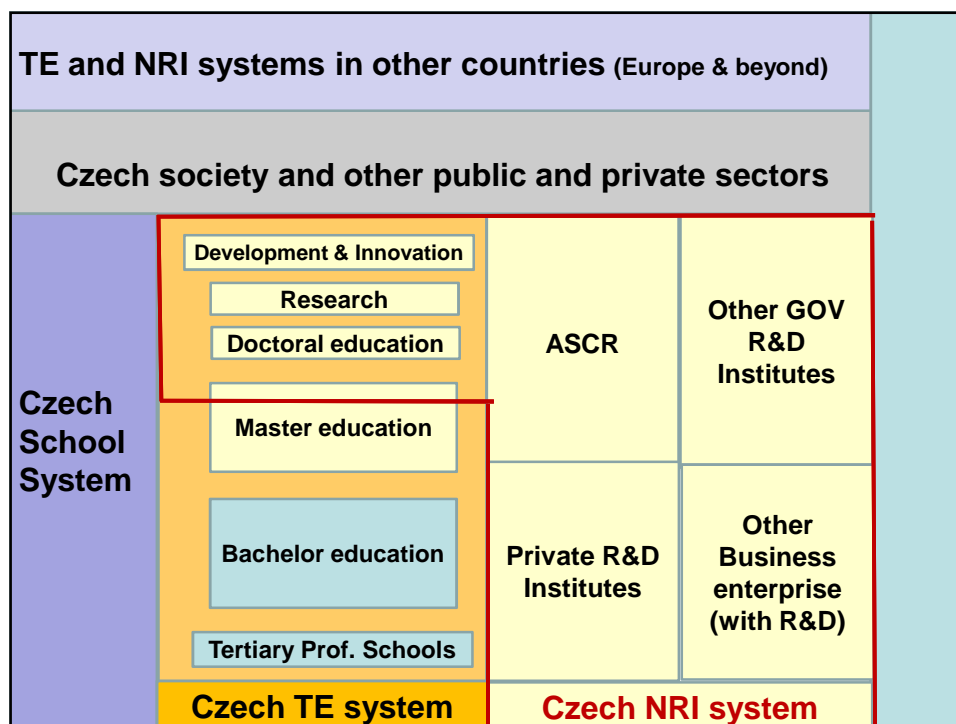
**cheps**



University of Twente  
The Netherlands

## The basis of our preliminary findings

- Literature review
- Analysis of policy documents
- Provision of statistics by Technology Centre
- Selected questions in the project 2010 survey (n= ca.1000)
- HR survey to University Deans and Research Institute Directors (n=74)
- 3 focus groups
- 50 interviews with actors in different positions in the Czech RDI system
- National HR for RDI consultative workshop (last week)



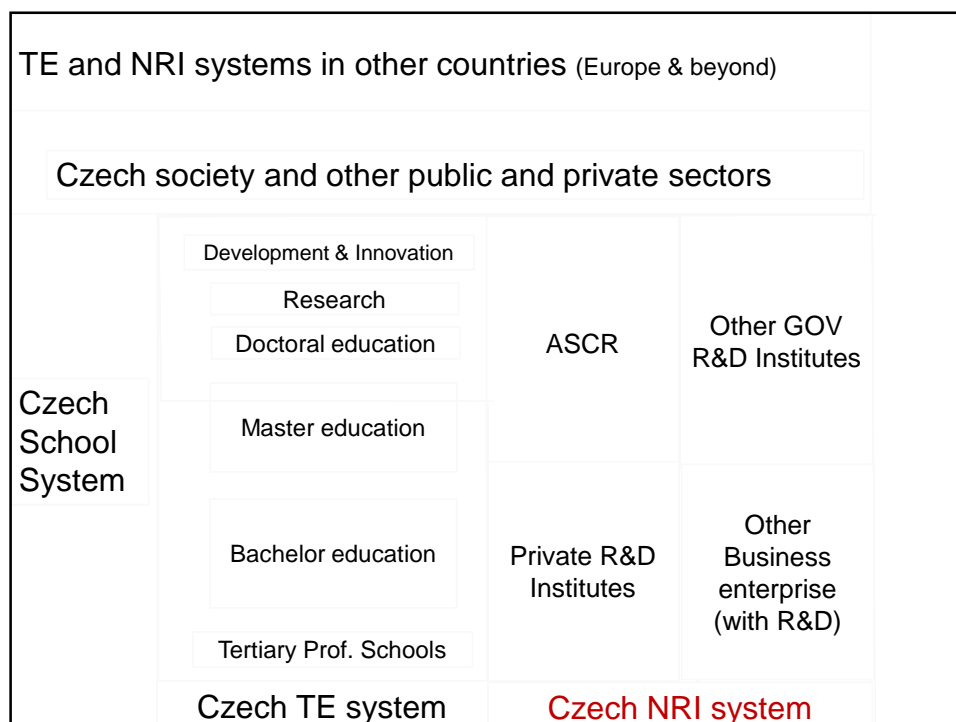


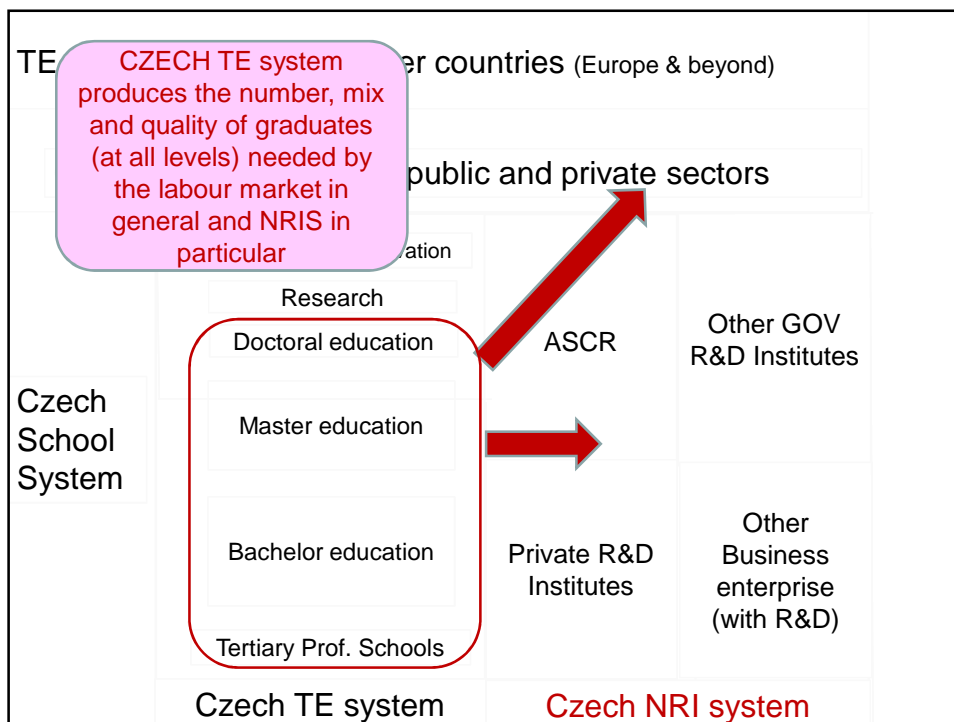
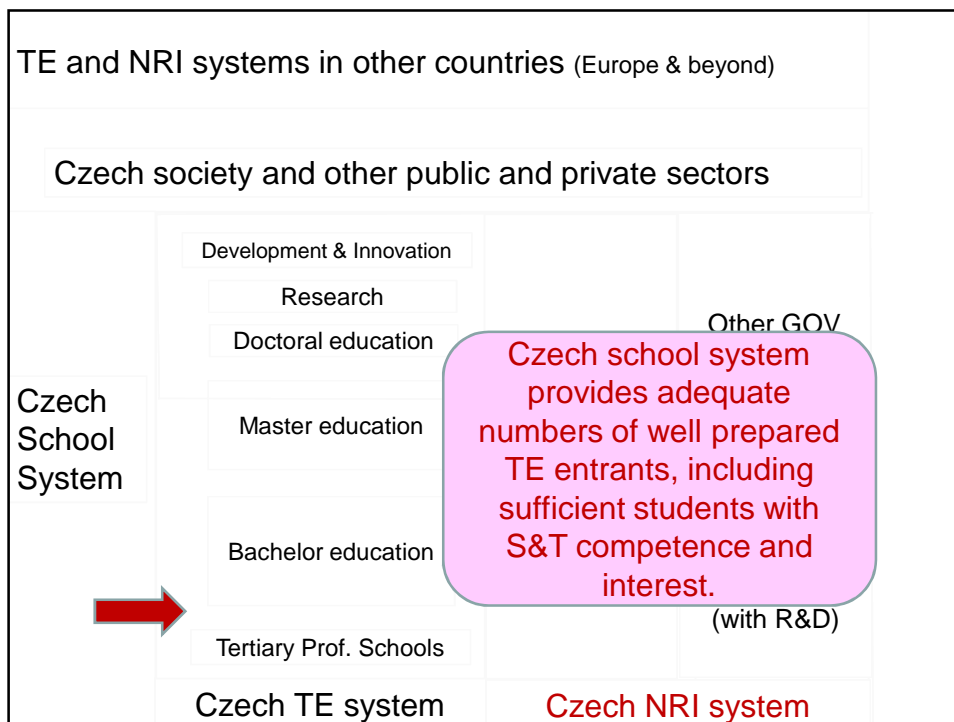
  
 University of Twente  
*The Netherlands*

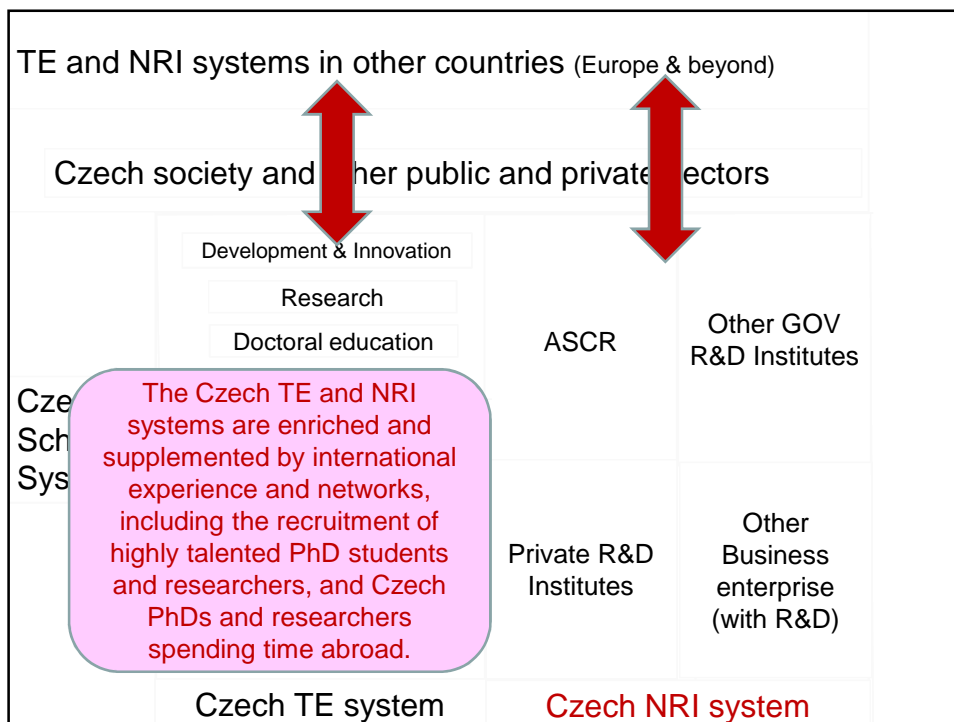
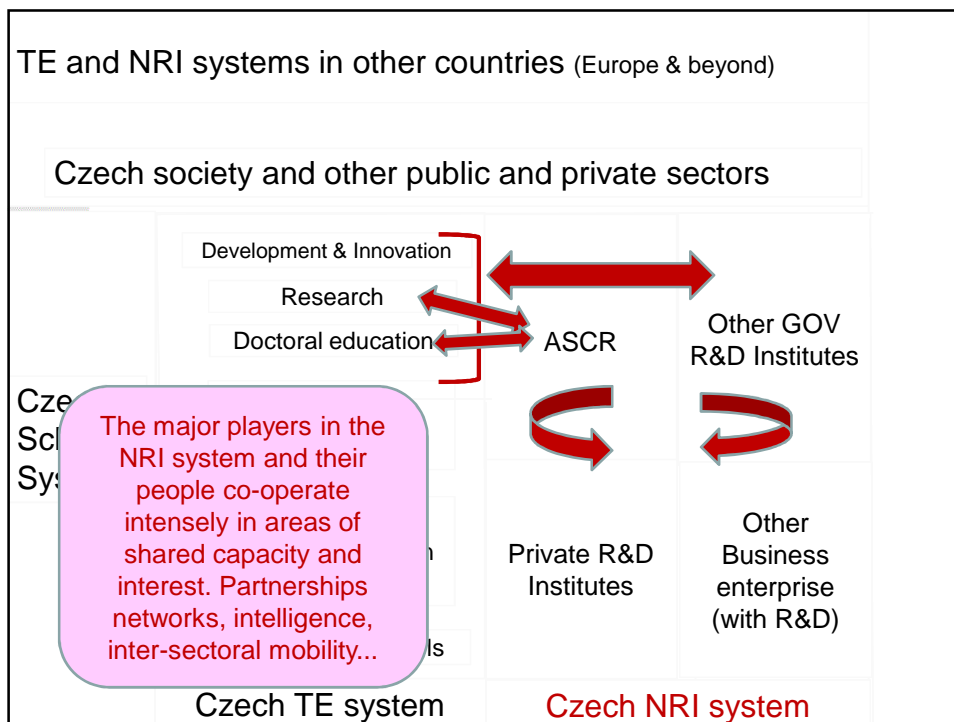
Part One

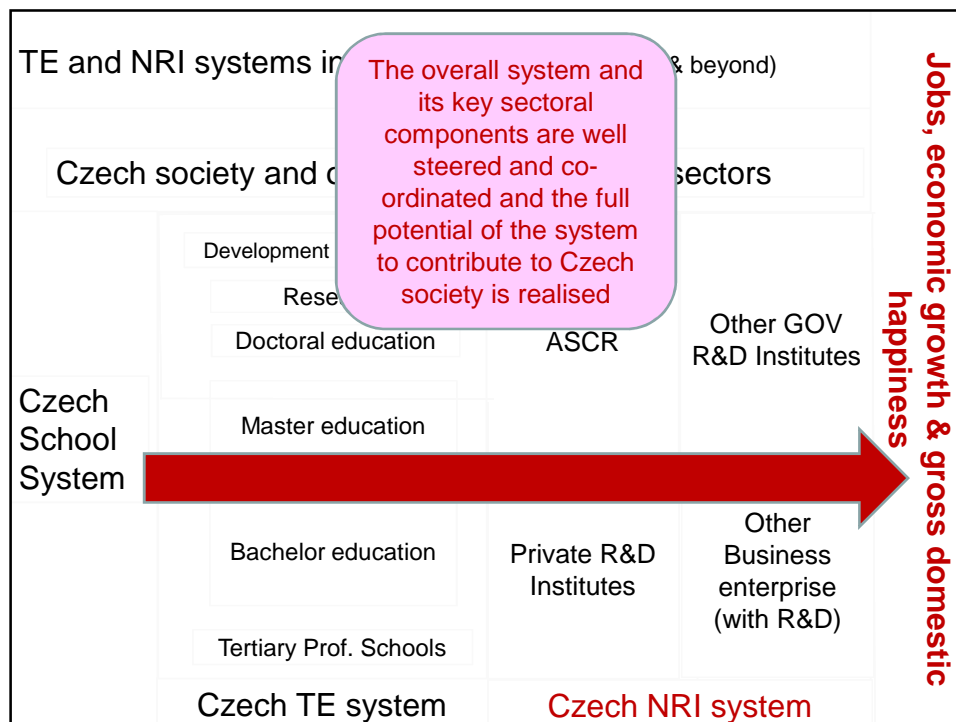
# A FAIRY TALE

(IN THE SENSE THAT IT DOESN'T EXIST ANYWHERE)







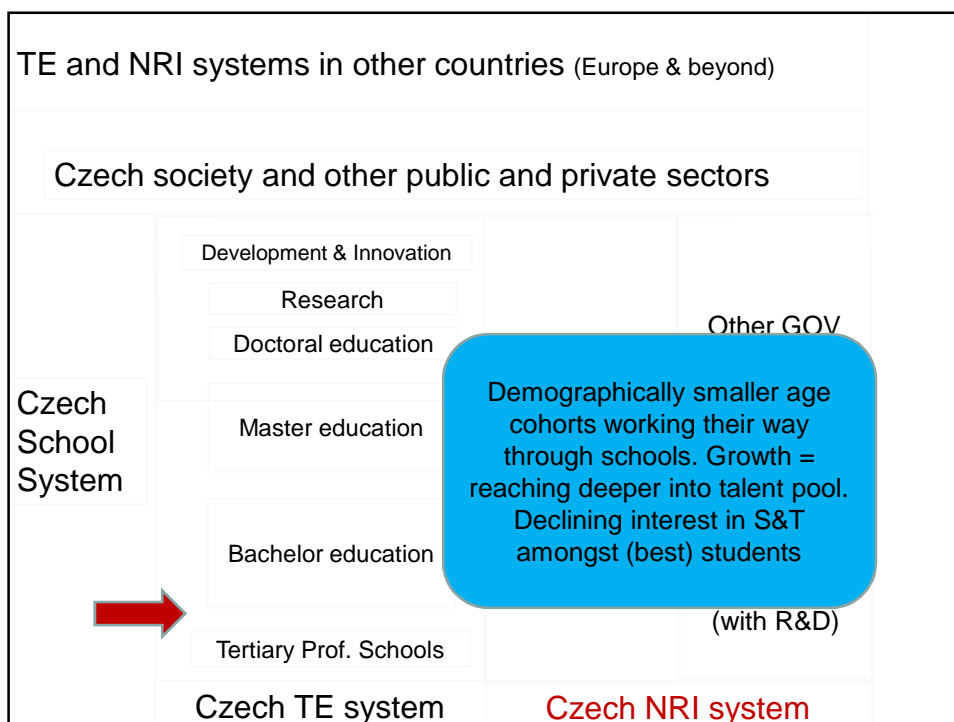
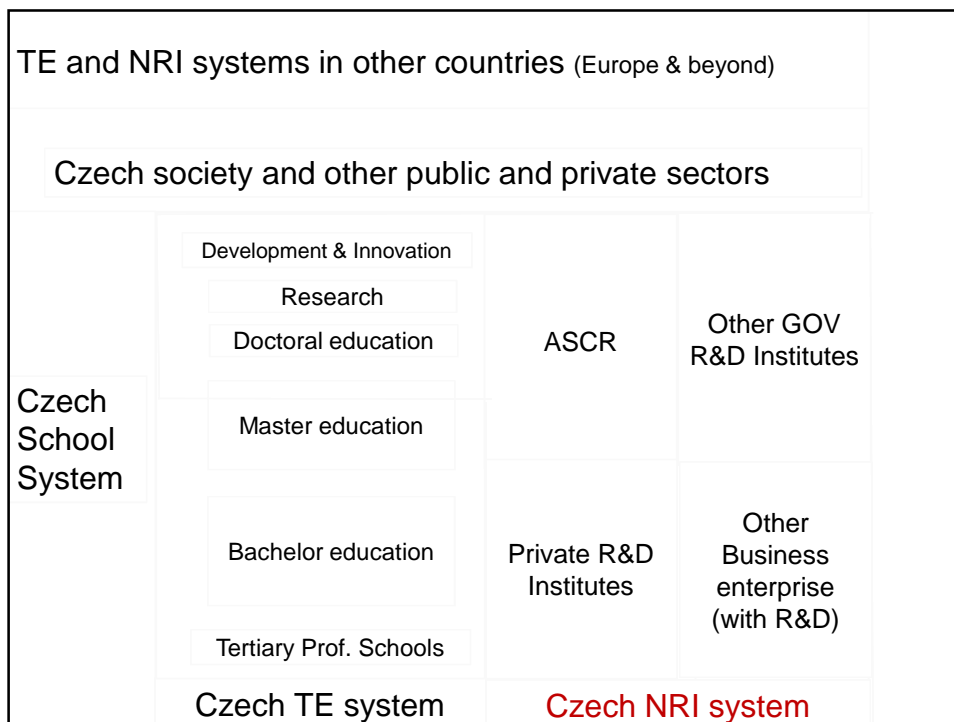


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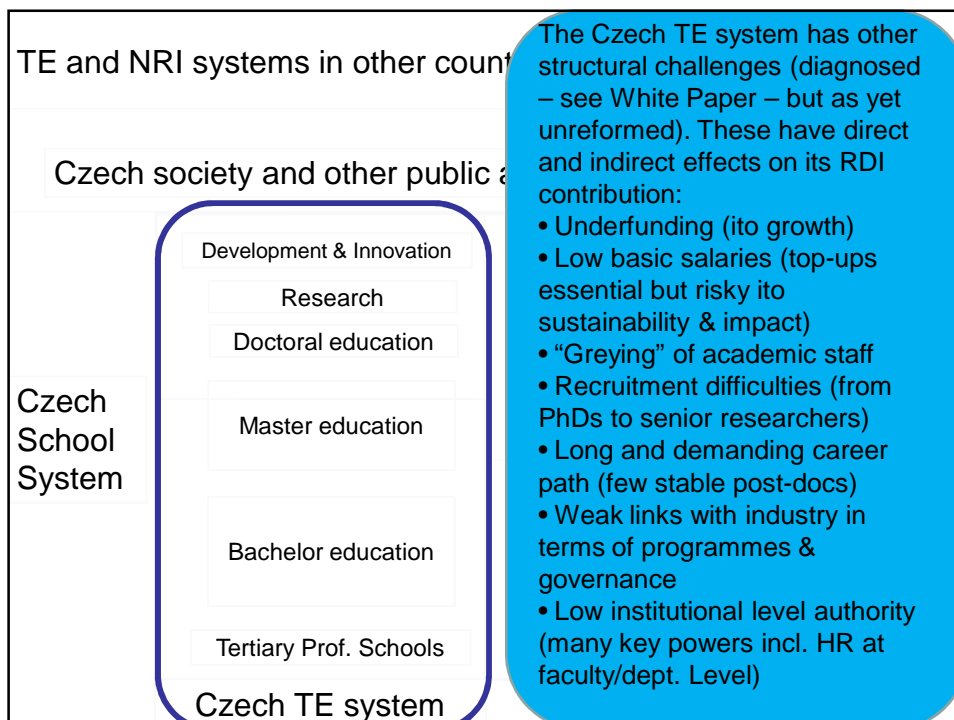
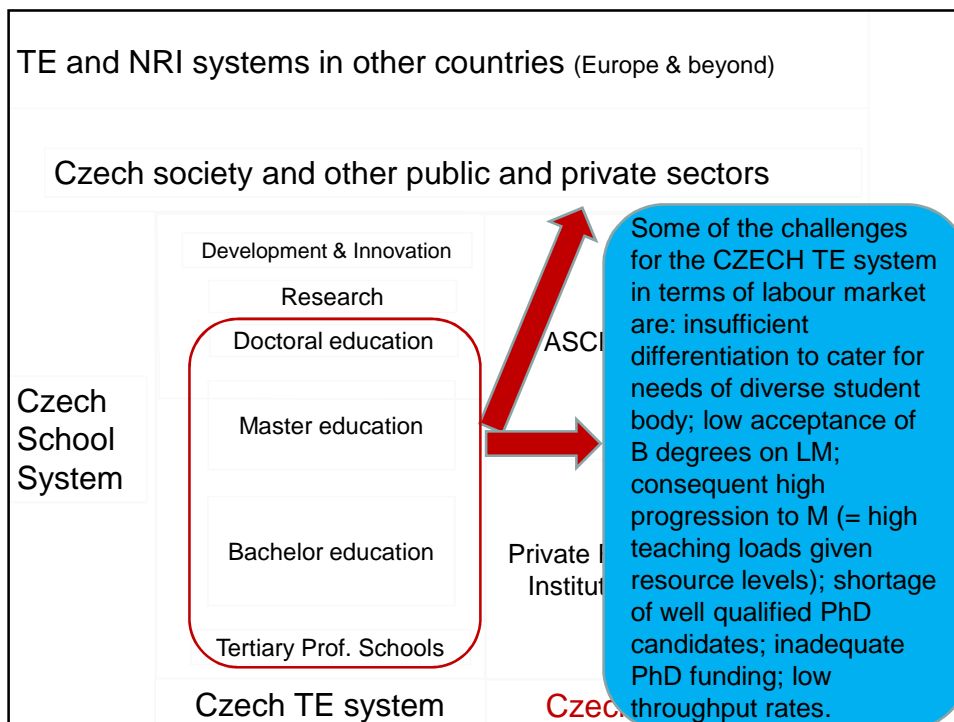
University of Twente  
The Netherlands

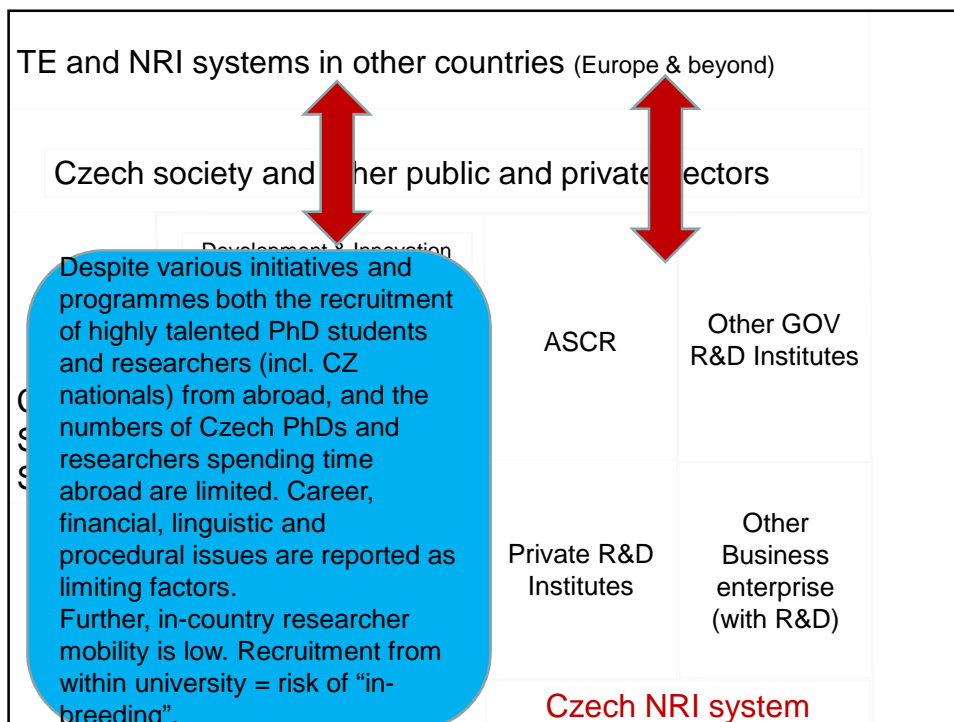
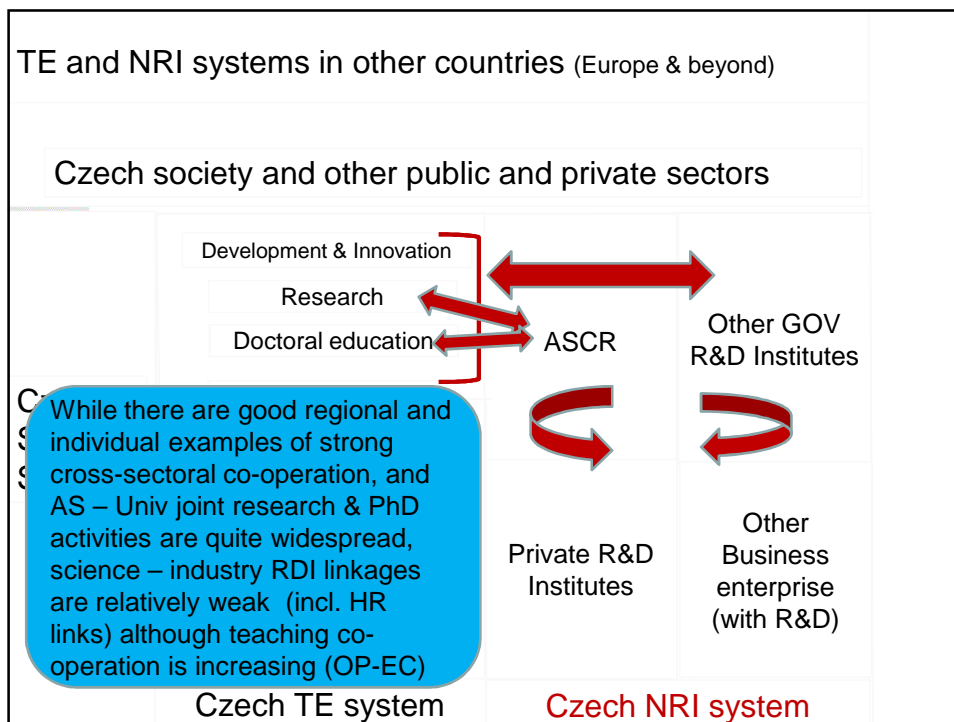
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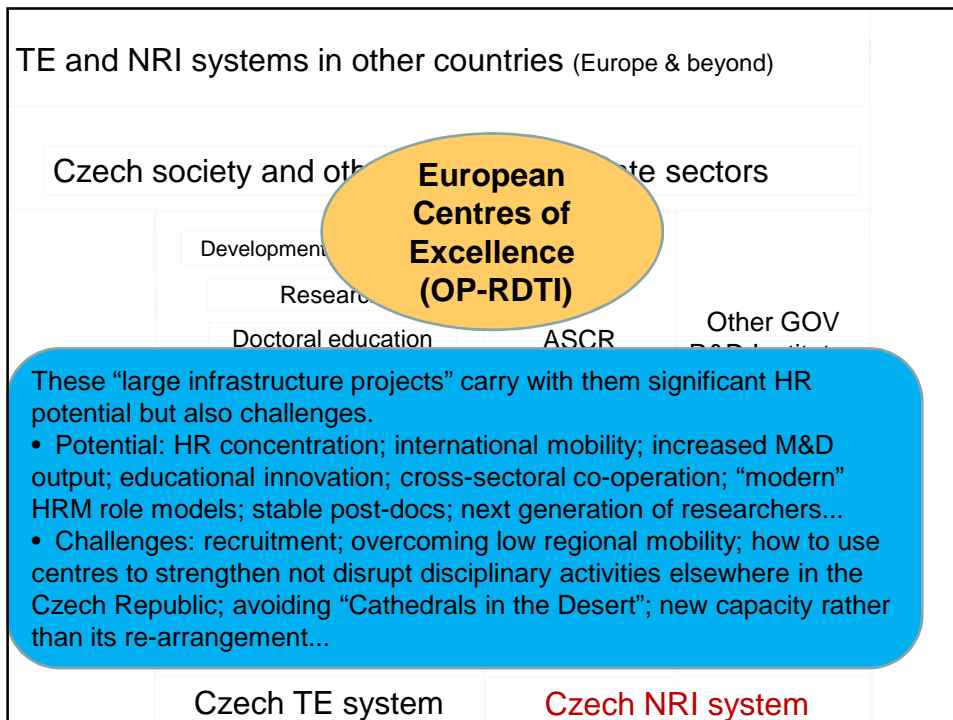
# MAJOR HR CHALLENGES FOR THE CZECH TE/NRI SYSTEMS











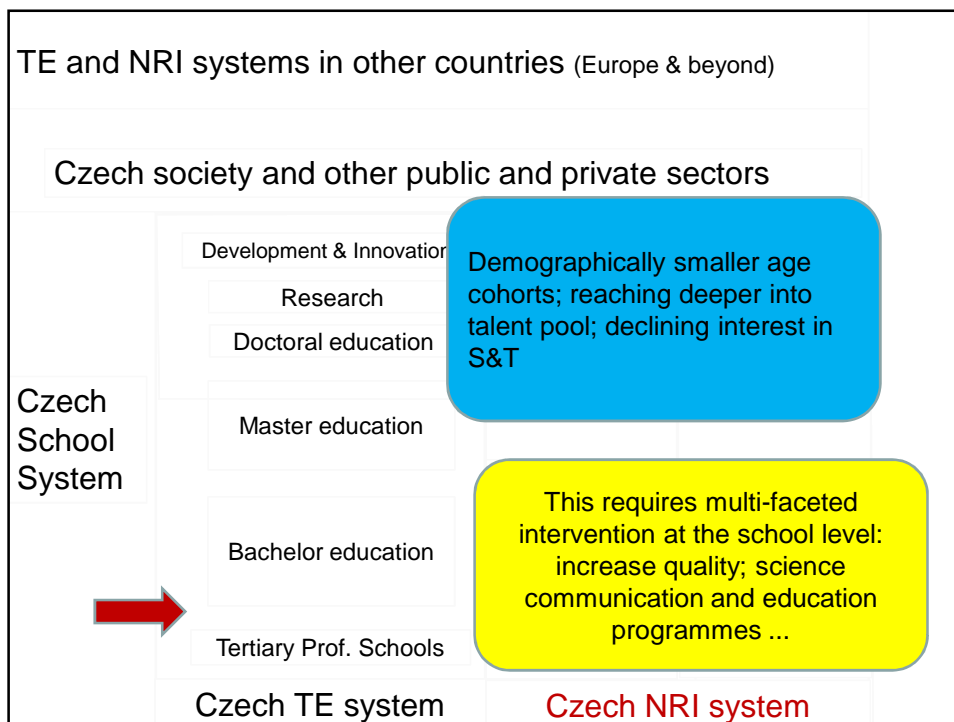
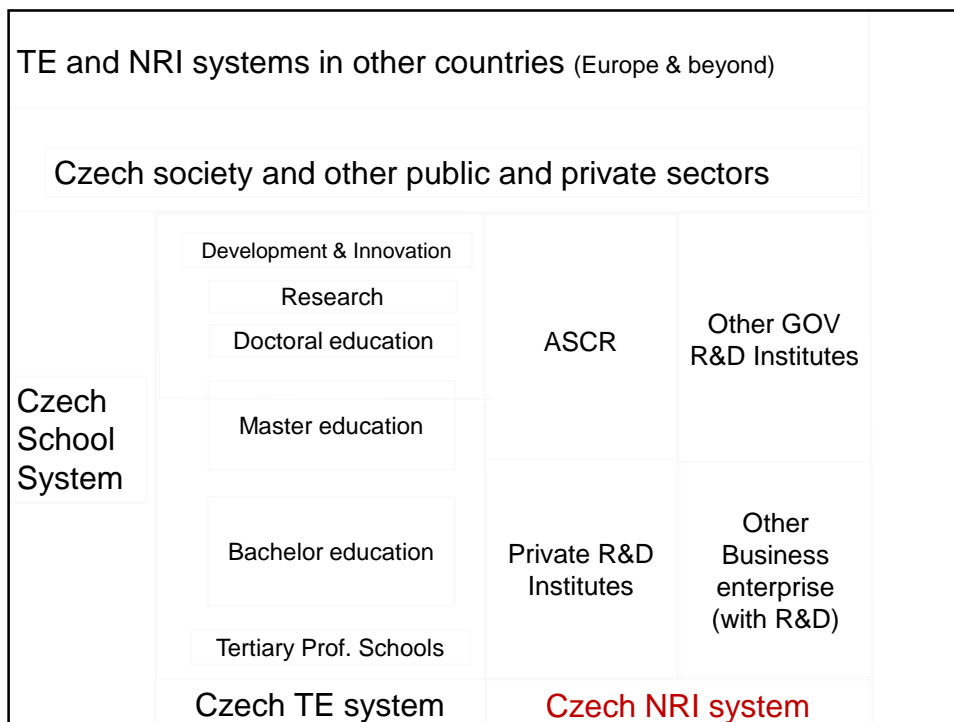
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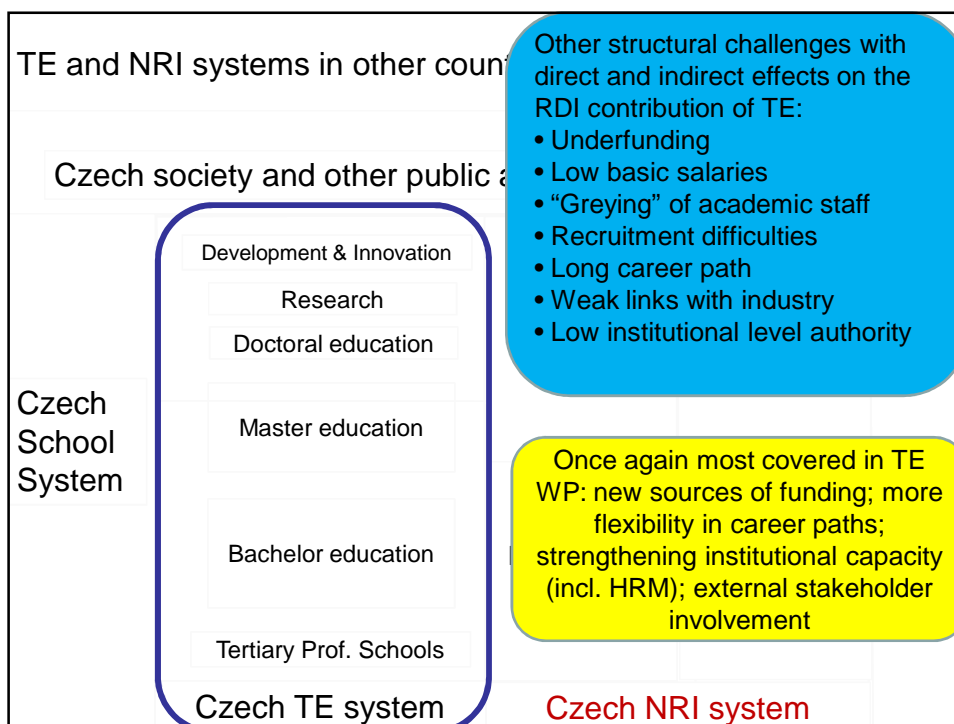
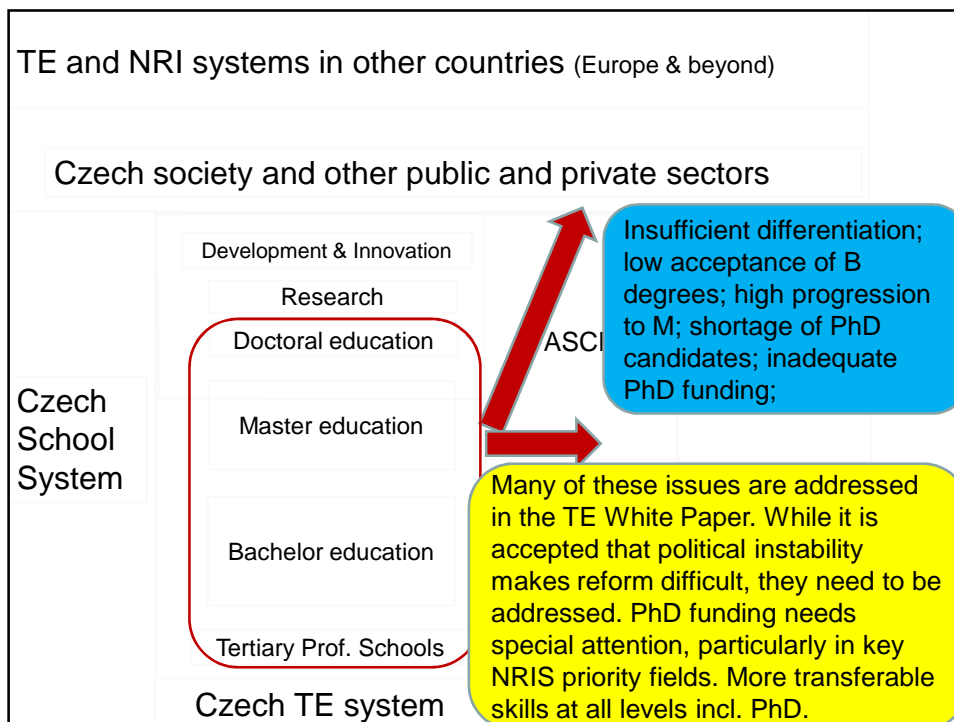
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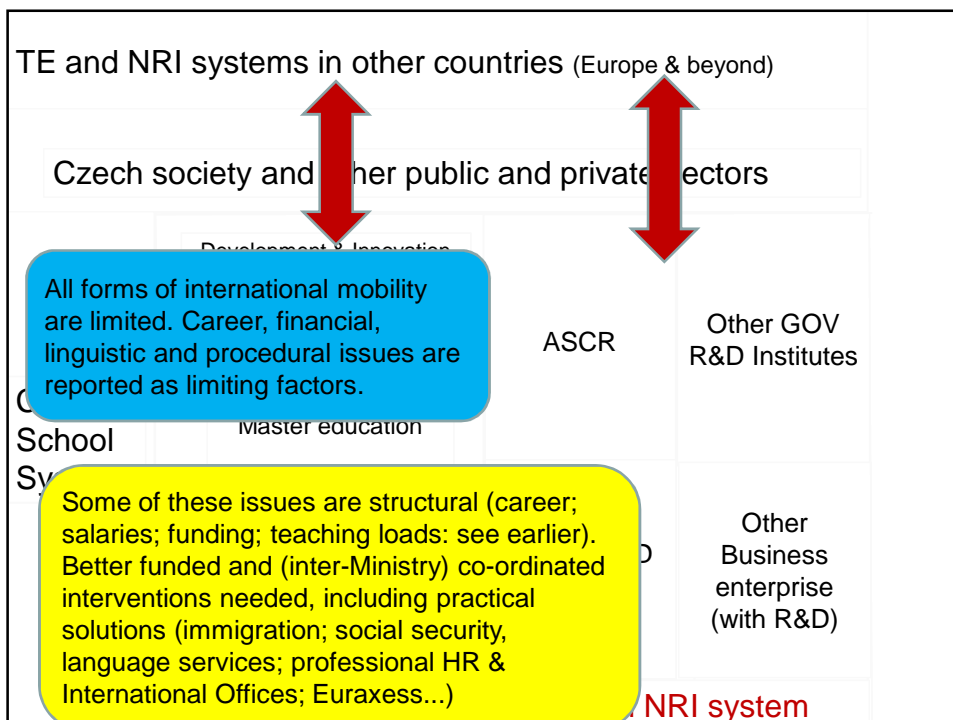
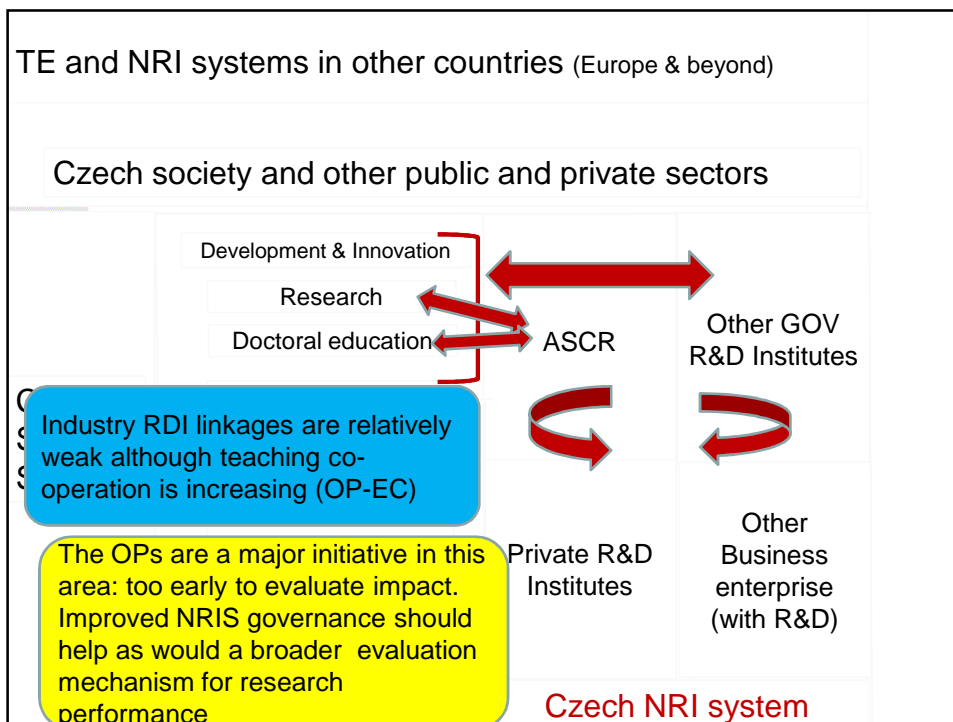
Part Three

**MAJOR PROVISIONAL RECOMMENDATIONS**

(THIS AFTERNOON WE CAN ALSO TALK ABOUT EUROPEAN GOOD PRACTICE)







In general, HR measures to strengthen RDI would be significantly helped by greater clarity on the priority fields (current and emerging) for Czech RDI. This would allow focused actions rather than across the board activities.

Czech society and other public and private sectors

**European  
Centres of  
Excellence  
(OP-RDTI)**

Development

Research

Doctoral education

ASCR

Other GOV

Potential: HR concentration; international mobility; increased M&D output; educational innovation; cross-sectoral co-operation; "modern" HRM role models; stable post-docs; next generation of researchers...

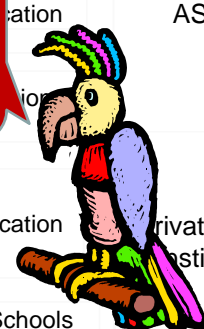
- Challenges: recruitment; overcoming low regional mobility; how to use centres to strengthen not disrupt disciplinary activities; new capacity rather than its re-arrangement...

Very careful monitoring needed and better integration with overall TE and RDI policy and planning. May need specific HR programmes to encourage regional mobility (joint appointments; weekly commuting...)

TE and NRI systems in other countries (Europe & beyond)

Czech society and other public and private sectors

Development & Innovation



**Thank you for  
your attention  
(and more this  
afternoon!)**

ASCR

Other GOV  
R&D Institutes

Czech  
Sch  
System

Bachelor education

Private R&D  
Institutes

Other  
Business  
enterprise  
(with R&D)

Tertiary Prof. Schools

Czech TE system

Czech NRI system

## Towards evaluation of research quality

*Workshop “Building blocks for research evaluation and institutional funding: evaluation culture and performance contracts”, Olomouc, 20 April 2011  
Barbara Good, Niki Vermeulen, Fritz Ohler, Louis Schlapbach*

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### Qualitative evaluation of research

- Evaluation Methodology focuses on counting outputs
- Good evaluation of research focuses on:
  - *Organisation of research and research programme*
  - *Key staff, teaming and strategic partners*
  - *Achievements and users of results*
  - *Management and human resource policy*
  - *Research funding*
  - *Perceived barriers in context of the organisation*
  - *Plans for the future*
- Evaluation performed through:
  - *Self-assessment report (including selected indicators)*
  - *International peer-review, including site-visit*
  - Evaluation report*



## Examples of qualitative evaluation (I)

International example:

- Netherlands: Standard Evaluation Protocol (1994-now)
    - *To assess quality of research in universities*
    - *To facilitate improvement of research and research management*
    - *Not a jury model but a coach model: improve quality of research*
    - *Organised by 3 main Dutch organisations for public research*
    - *Evaluation of each disciplinary area, every 6 years*
    - *Criteria:*
      - Quality
      - Productivity
      - Societal relevance
      - Vitality and feasibility
    - *Accounting for differences between disciplines and interdisciplinarity*
- Evaluating Research in Context (ERiC)*

## Examples of qualitative evaluation (II)

Examples in the Czech Republic:

- Academy of Sciences (1993-now)
  - *emphasis on quality of research (management, HRM, strategy, etc.)*
  - *also using Dutch model as example (SWOT analysis)*
  - *provides experience with qualitative evaluation*
  - *room for improvement*
- The international audit (2011)
  - *16 research groups from various organisations:*
  - *6 different research fields*
  - *6 teams of 3 international peers and a guarantor*
  - *6 evaluation reports*
  - *valuable experience for evaluated groups and evaluators*

## Questions

- Does anyone have experience with qualitative research evaluation?
- What are major benefits of qualitative evaluation?
- What are the expected challenges in the Czech context?
- Which organisation(s) should take care of the evaluation?
- Other questions?

Thank you

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## The Role of the R&D&I Council in the Governance System

*Erik Arnold*  
*Technopolis*

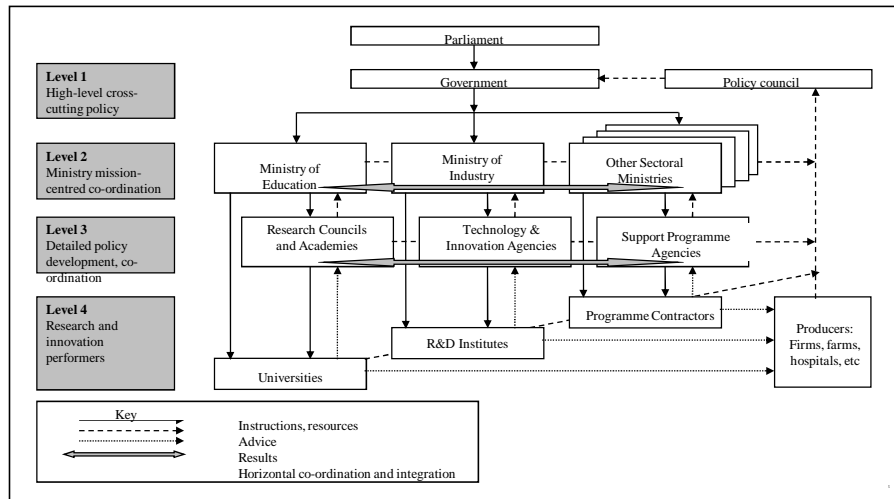
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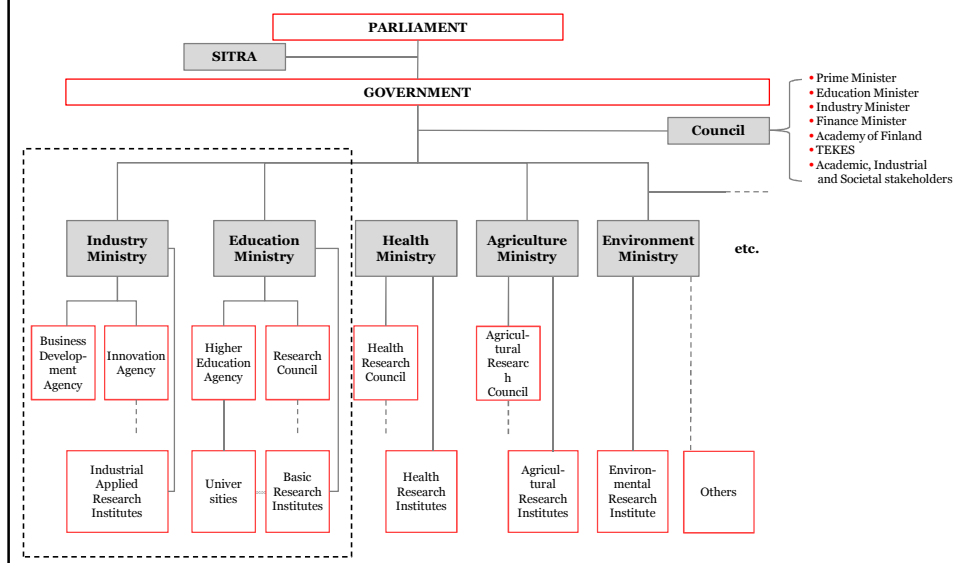
## International Practice

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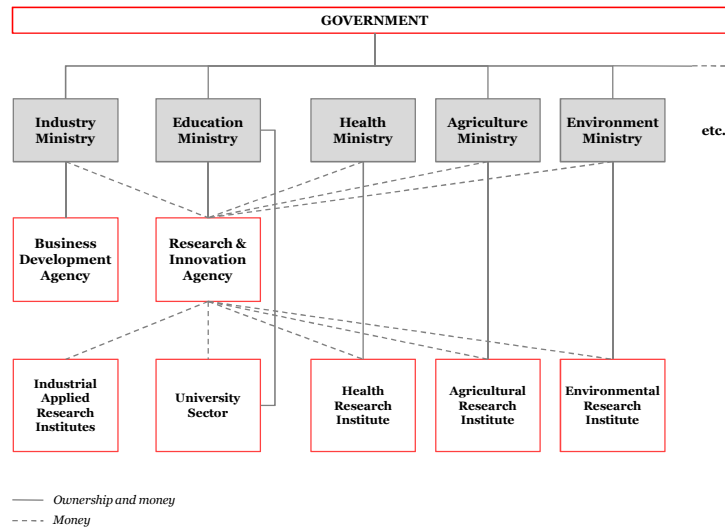
## All countries struggle to govern the state's role in the NIS



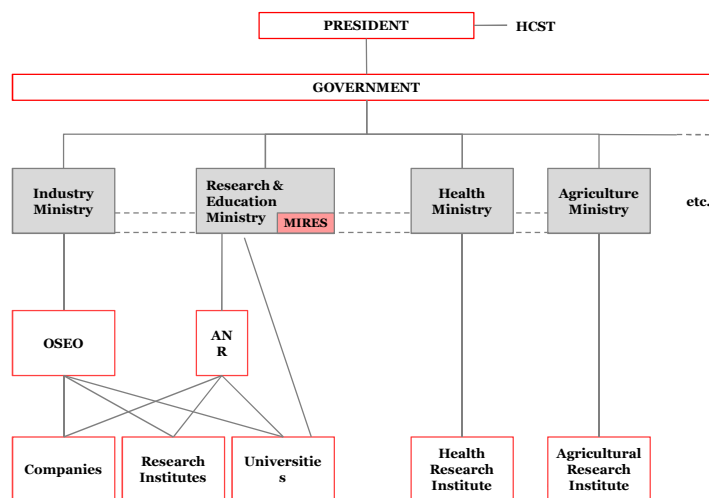
## The 'two pillar' model in Finland is highly effective



## Coordination through an agency (Norway) is less so



## Coordination by a science ministry (France) also has limitations



### No structure is perfect

- Having multiple ministries responsible for research increases the need for coordination among sectors
- But the ‘science ministry’ approach makes it the enemy of the rest, and reduces the number of voices speaking for research
- Information asymmetries between principals and agents (ministries and agencies; agencies and beneficiaries/stakeholders) reduce the quality of policies and interventions that are centrally designed
- Councils attempting themselves to make **detailed** strategies need large amounts of analytic support (Chile, Czech Republic)

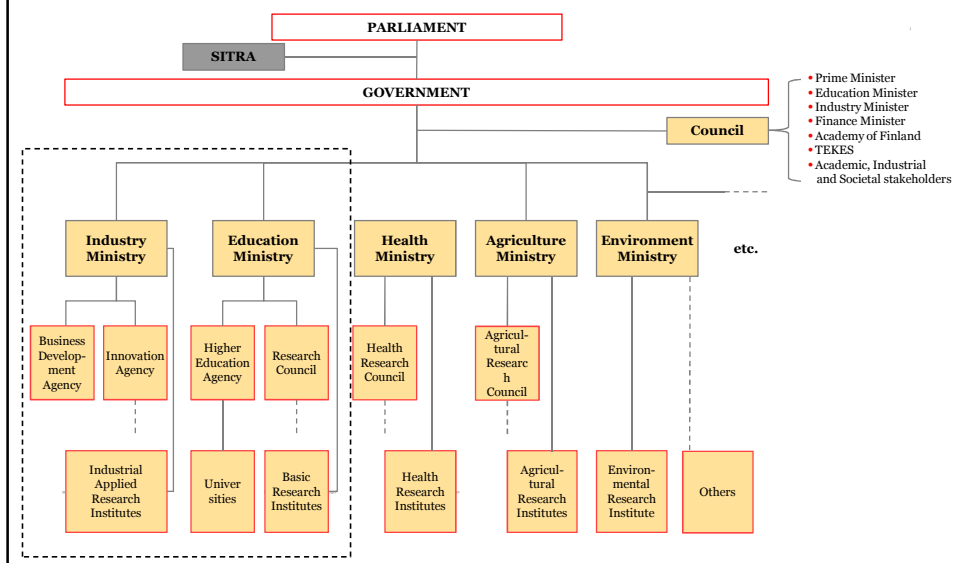
### Internationally, there are 3 kinds of Council

- A **joint planning model** (Japan), where the government uses the Council as a virtual “horizontal ministry of innovation”, much as engineering companies build project teams by bringing together people across different disciplines
- A **co-ordination model** (Chile, Finland, Netherlands Innovation Platform, to some extent Austria), where the intention is that the council should communicate horizontally across ministry responsibilities so as to align policies in support of innovation, without this alignment always being binding
- An **advice model** (Canada, Denmark, Ireland, Netherlands AWT, Sweden, Switzerland, UK), where the government is happy to be proactively or reactively advised on research and innovation policy but does not want to be restricted by that advice

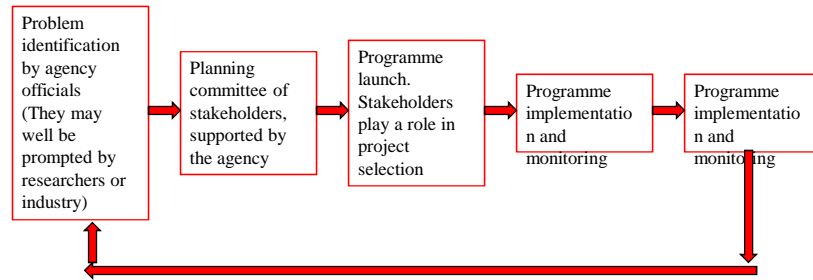
## Desiderata for Councils

- Functions as an open **arena** for **consensus**
- Is **legitimate** in scientific, industrial and political terms
- Collates and publishes **strategic intelligence** when needed, within a system of distributed strategic intelligence
- Sets **long-term strategic directions**, reducing dynamic inconsistency
- **Coordinates** vertically, horizontally and over time
- Has a **high profile** with the government and the public
- Is independent enough to be a **change agent**
- Has a clear **interface to government**

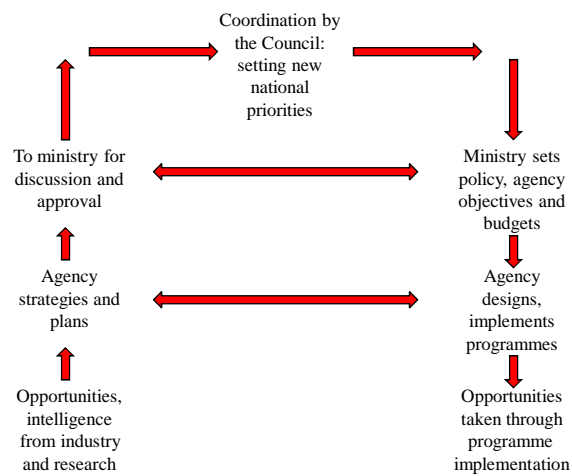
## Where's the strategic intelligence in Finland?



## Nordic programme planning model – Agency level



## In the Nordic model, policy and programme design are decentralised but coordinated





### R&D&I governance has to be robust against globalisation, the ERA and major changes in institutions

- Participation in higher education is tending to about 50% – at which point it costs several % of GDP
  - *Forcing new modes of financing*
  - *Underpinning a change in view of higher education from being a **social** to an **individual** investment*
- **Globalisation** of education and research markets
- Competition rigorously enforced, *inter alia* through publication of research, education and combined **rankings**
- Non-government sources play an increasing part in funding, so the sector increasingly has **new customers**
- Scale is visibly playing a role, with the emergence of **‘superuniversities’**

### National reforms in most European countries

- Shifting funding base in education
  - *From block grants*
  - *To payment by results*
- Shifting funding base in research
  - *From block grants*
  - *To a ‘binary’ system, where quality-assured project funding is expected to control the quality of the whole*
  - *To competition for institutional as well as project funding*
- Stakeholder representation in governance and the promotion of ‘third mission’ activities and income
- Increased autonomy – replacing civil service control with ‘the golden rule’ (*ie she who has the money makes the rules*)

## A European education and research area

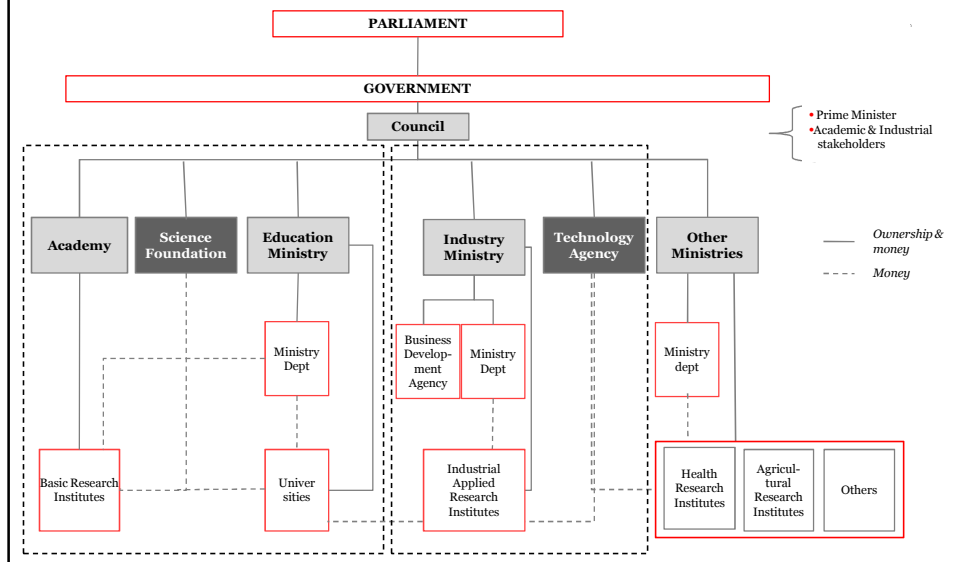
- Bologna
- A change in ‘European Added Value’ from networking and adding resources to the national to coordinating and ‘structuring’
- Pursuit of the ‘European Research Area’
  - *Aiming to optimise the European innovation system at the European, not the national, level – cp the EIT / KICs*
  - *Driving scale and specialisation, to promote global research competitiveness and hence increased scale and specialisation*
- Some shift from economic to research and societal drivers
  - *Traditionally the Framework was the Commission’s industry policy*
  - *‘Grand challenges’ and Joint Programming will be FP8 principles*
  - *Industrial participation is in long-term decline – to be reinvigorated by self-organised instruments such as JTIs*

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## The R&D&I Council in the Czech Republic

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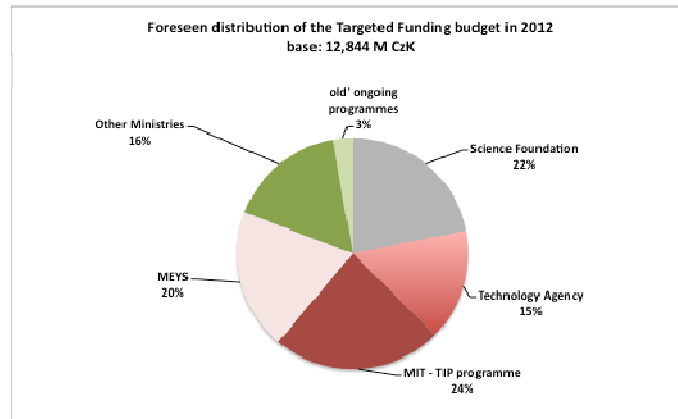
## Czech Republic model is hybrid, transitional



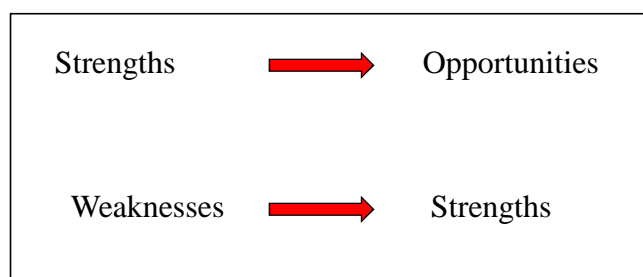
## Current functions of the R&D&I Council

- Define and implement principles of R&D&I governance
- Allocate the national R&D&I budget across budget lines
- Approve all state R&D programmes
- Monitoring and evaluation
  - *Annual analyses and evaluations of the state of R&D&I*
  - *Development and use of the Evaluation Methodology for institutional funding*
  - *Information system of R&D outputs*
  - *Annual benchmarking of completed R&D programme outputs*
  - *Scrutiny of ministry R&D strategies*
- Define national R&D&I policy and national R&D priorities
- Other support to the governance of R&D&I
- *De facto*, act as principal to the Science Foundation and Technology Agency

## Targeted funding distribution in 2012



Workshop exercise (1): For each of the four structures, consider in the Czech Republic ...



(2) What overall Key Success Factors can we derive for the governance of the Czech research system, independent of organisation?

Thank you

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[erik.arnold@technopolis-group.com](mailto:erik.arnold@technopolis-group.com)

technopolis **group** has offices in Amsterdam, Ankara, Brighton,  
Brussels, Frankfurt/Main, Paris, Stockholm, Tallinn and Vienna

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