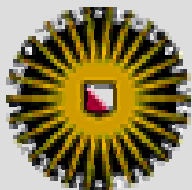


European / German efforts and policy evaluation in facilitating industry-academia cooperation and regional innovation

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International Workshop on the Comprehensive Review of the S&T Basic Plans in Japan
- Towards the effective benchmarking of integrated S&T Policy –
Tokyo, NISTEP; 13.-14. September, 2004



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Overview

- Policy aims and context
- Innovation in European regions
- Policy instruments and evaluation practice: examples
- Conclusions



Aims of public policies

- Foster research and innovation performance and growth within "regions"
- Mitigate regional disparities in innovation performance and growth, within countries and across Europe
- There are national and EU policies for regions, as well as endogenous regional policies



Research and innovation systems - a socio-economic concept

- Innovation systems encompass the “biotopes” of all those **institutions** which are engaged in scientific research, the accumulation and diffusion of **knowledge**, which educate and train the working population, develop **technology**, produce innovative **products** and processes, and **distribute** them.
- To this belong also the relevant **regulatory bodies** (standards, norms, laws), as well as the state investments in appropriate **infrastructures**.
- Innovation systems extend over schools, universities, research institutions (**education and science system**), industrial enterprises (**economic system**), the politico-administrative and intermediary authorities (**political system**) as well as the formal and informal networks of the actors of these institutions.
- **Each innovation system is different.** Sustainable innovation systems develop their special profiles and strengths only slowly, in the course of decades or centuries. They are based on stable exchange relationships among the institutions of science and technology, industry and the political system.
- There are **national, regional and sectorial** innovation systems.

Source: Kuhlmann 2001

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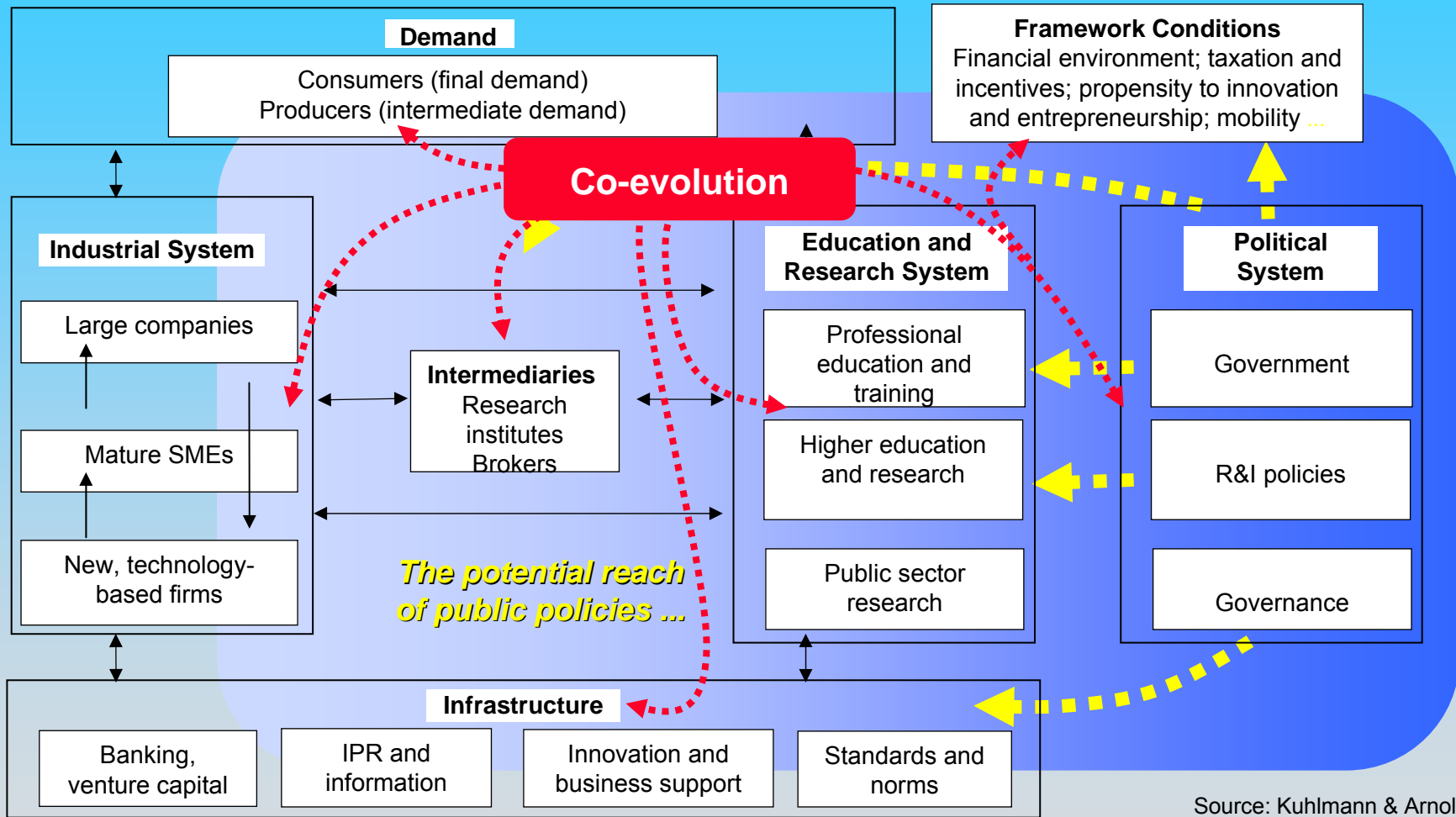
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The innovation system model: a heuristic tool

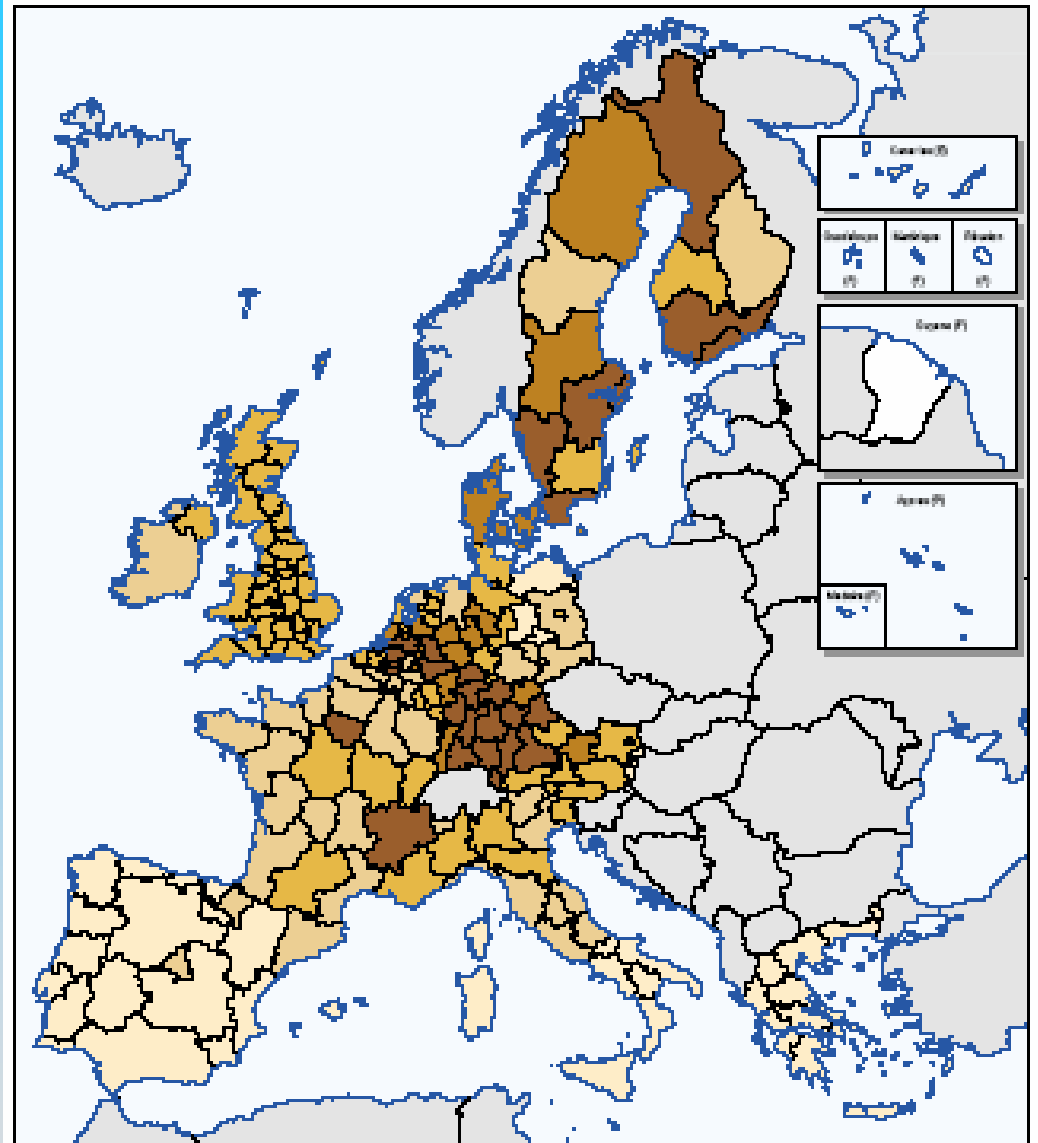


Source: Kuhlmann & Arnold 2001



Innovation in European regions (I): European patent applications, average 1994-96

Source: Sixth Periodic Report on the Social and Economic Situation and Development of Regions in the European Union



Map 34 European patent applications, average 1994 to 1996

Number per million inhabitants



EUR16 = 91
Standard deviation = 66
EL, P, UK: national level
FR: 166

Source: Eurostat

0 100 200 km



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Innovation in European regions (II)

Indicator	Leading regions				
1 Tertiary education	London (UK)	Uusimaa (suuralue) (FI)	Brussels (BE)	Île De France (FR)	Stockholm (SE)
2 Life-long learning	London (UK)	South West (UK)	Eastern (UK)	South West (UK)	Uusimaa (suuralue) (FI)
3 Medium/high-tech empl in manuf	Stuttgart (DE)	Tübingen (DE)	Braunschweig (DE)	Franche-Comté (FR)	Karlsruhe (DE)
4 High-tech empl in services	Stockholm (SE)	Uusimaa (suuralue) (FI)	Île De France (FR)	Flevoland (NL)	Niederösterreich (AT)
5 Public R&D	Flevoland (NL)	Midi-Pyrénées (FR)	Berlin (DE)	Braunschweig (DE)	Dresden (DE)
6 Business R&D	Västsverige (SE)	Braunschweig (DE)	Stuttgart (DE)	Stockholm (SE)	Oberbayern (DE)
7 Hi-tech EPO patents	Noord-Brabant (NL)	Uusimaa (suuralue) (FI)	Oberbayern (DE)	Stockholm (SE)	Pohjois-Suomi (FI)
8 All EPO patents	Oberbayern (DE)	Noord-Brabant (NL)	Stuttgart (DE)	Stockholm (SE)	Uusimaa (suuralue) (FI)
9 Innovative manuf enterprises	Koblenz (DE)	Karlsruhe (DE)	Tirol (AT)	Mittelfranken (DE)	Schwaben (DE)
10 Innovative services enterprises	Saarland (DE)	Gießen (DE)	Wales (UK)	Burgenland (AT)	Arensberg (DE)
11 Innovation expend manuf	Bremen (DE)	Östra Mellansverige (SE)	Saarland (DE)	Västsverige (SE)	Stockholm (SE)
12 Innovation expend services	Burgenland (AT)	Gießen (DE)	Região Autónoma Da Madeira (PT)	Saarland (DE)	North East (UK)
13 Sales of new-to-firm products	Braunschweig (DE)	Hannover (DE)	Lazio (IT)	Köln (DE)	Saarland (DE)

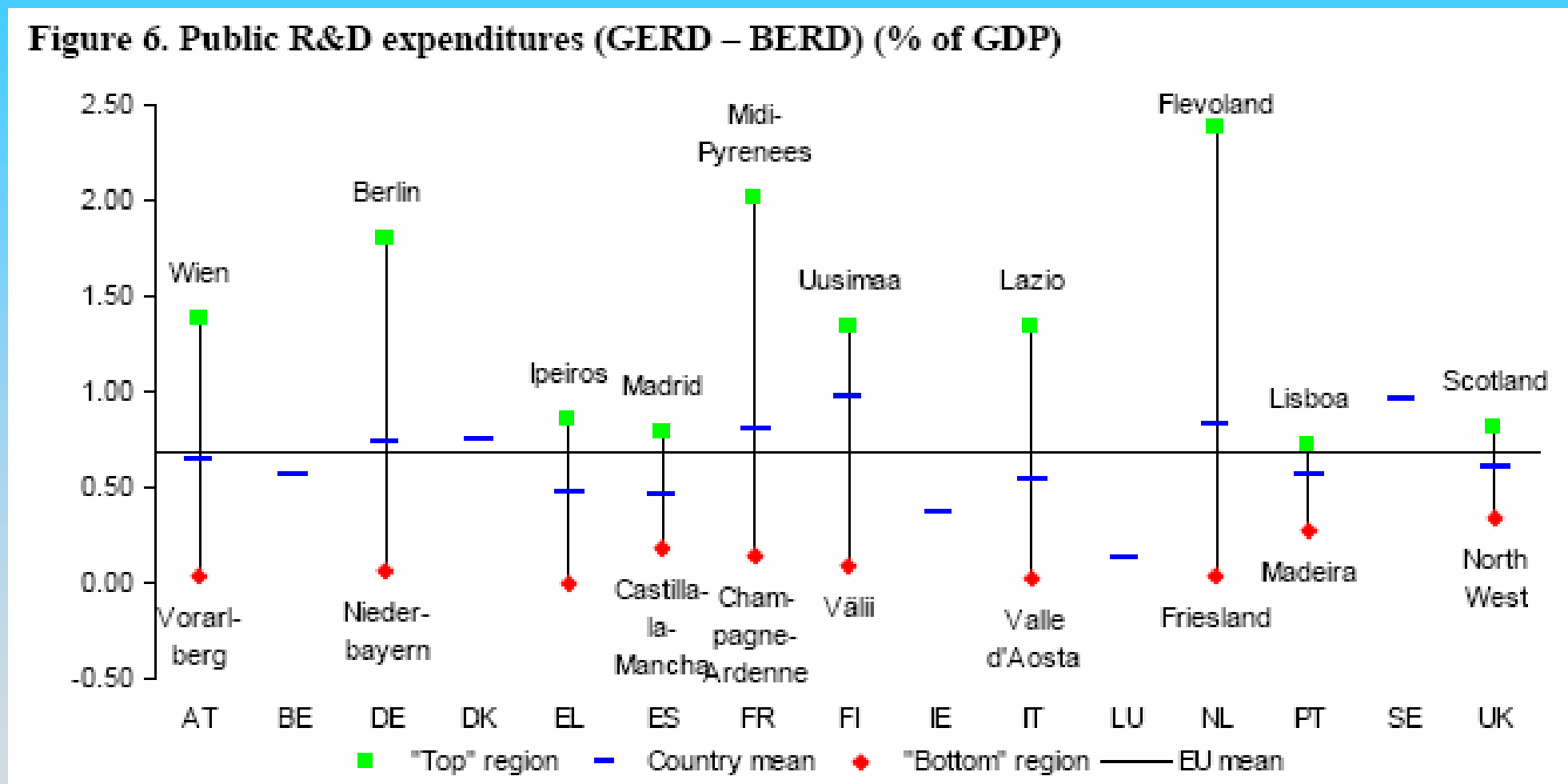
Source: 2003 European Innovation Scoreboard: Technical Paper No 3, Regional innovation performances November 28, 2003



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Innovation in European regions (III)

Figure 6. Public R&D expenditures (GERD – BERD) (% of GDP)



Source: 2003 European Innovation Scoreboard: Technical Paper No 3, Regional innovation performances, November 28, 2003

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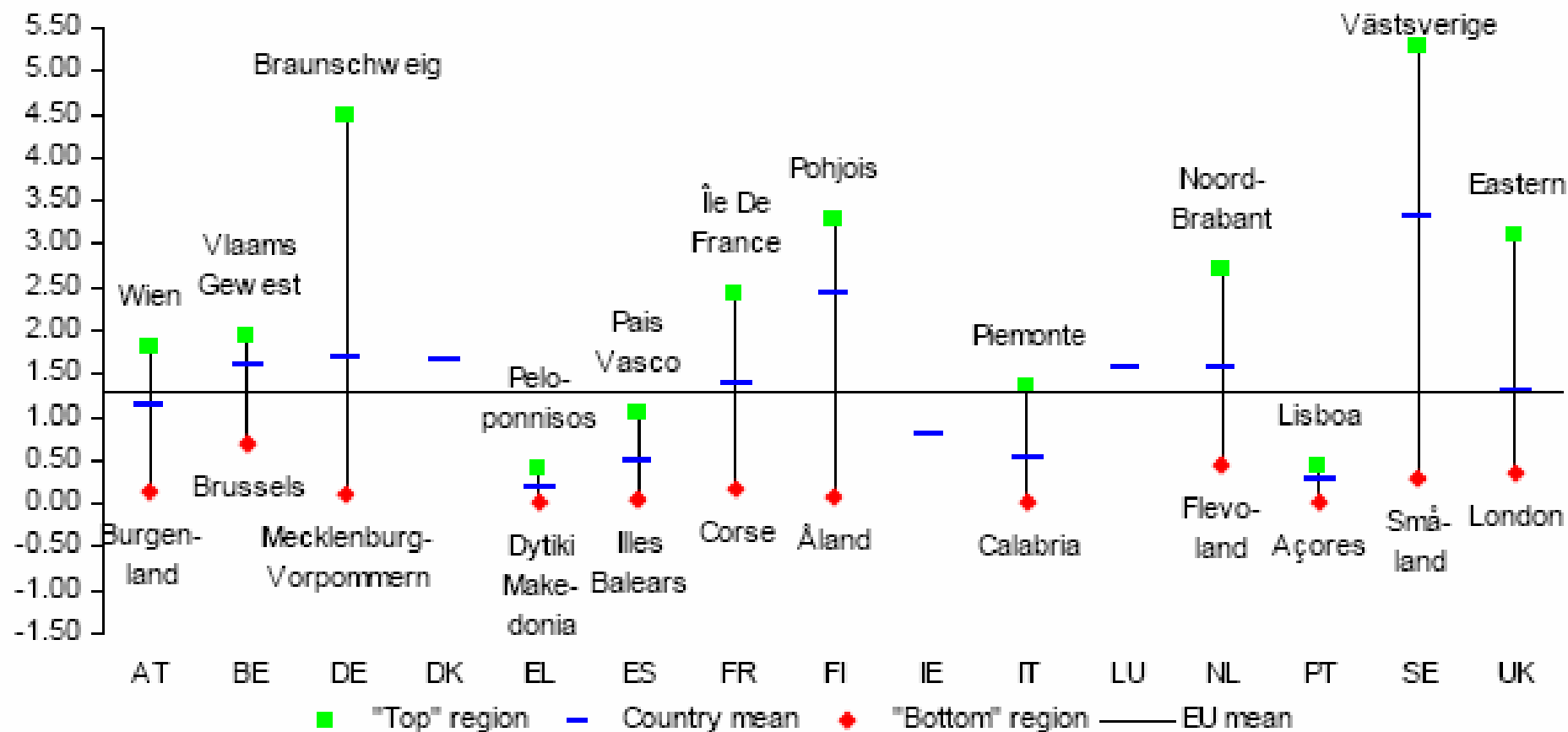
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Innovation in European regions (IV)

Figure 7. Business expenditures on R&D (BERD) (% of GDP)

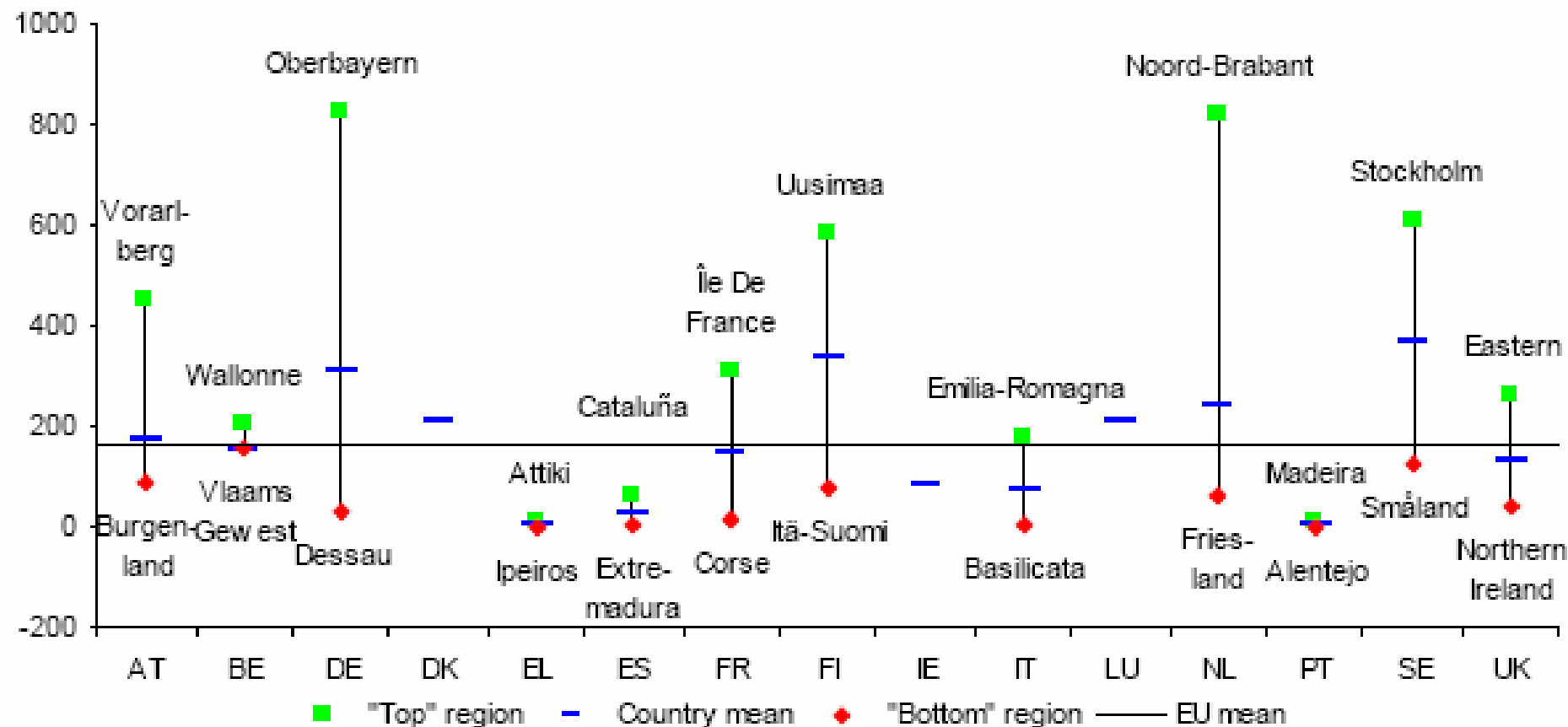


Source: 2003 European Innovation Scoreboard: Technical Paper No 3, Regional innovation performances, November 28, 2003



Innovation in European regions (V)

Figure 9. EPO patent applications (per million population)



Source: 2003 European Innovation Scoreboard: Technical Paper No 3, Regional innovation performances, November 28, 2003



Instruments of public research and innovation policy

- regional, national, transnational

Instruments in a narrow sense

1. Institutional funding
 - National Research Centres
 - Research Councils (in Germany DFG; Max Planck Society)
 - Applied Research and Techn. Development Organisations (in Germany e.g. Fraunhofer Society)
 - Universities and other Higher Education Institutions
 - Others
2. Financial incentives
 - Indirect promotion programmes (e.g. CIM)
 - Technology promotion programmes (cooperative R&D projects)
 - Risk capital
3. Other infrastructure and technology transfer mechanisms
 - Information and consultancy for SMEs
 - Demonstration centres
 - Cooperation, networks, people

Instruments in a broader sense

4. Public demand and procurement
5. Systemic measures
 - Long-term visions; technology foresight
 - Technology assessment
 - Regulation, Standards, IPR
6. (Continuing) education; training
7. Public policy
 - Competition policy
 - (De-) Regulation
 - Public stimulation of private demand



Policy measures supporting facilitating industry-academia cooperation and regional innovation

- There is a huge variety of public policies aiming at university-industry collaboration and regional innovation, in Germany and in Europe generally,
 - In Europe **241** policy measures supporting cooperation research/universities/companies; **121** measures supporting clustering and co-operation for innovation (see <http://trendchart.cordis.lu>), run on national scale, independent regional measures not included
 - In Germany **21** policy measures supporting cooperation research/universities/companies; **16** measures supporting clustering and co-operation for innovation (see <http://trendchart.cordis.lu>), run on national scale, "Länder" measures not included
- **No coherent evaluation practice** across this scope of measures; differences country by country, agency by agency



Example: RITTS (Regional Innovation and Technology Transfer Strategies and Infrastructure), a programme of the EU Commission

- RITTS : Support for developing regional innovation strategies, based on analyses of the regional innovation system, including management, financial, commercial, training, organisational and technical issues (see <http://www.innovating-regions.org/network/presentation/regional.cfm>)
- RITTS was implemented in 42 European regions
- **Evaluation** (based on documents, questionnaires, case studies; see <http://www.innovating-regions.org/download/finalrep.doc>) showed that RITTS had positive impacts :
 - It brought in a move towards strategic thinking for innovation-oriented regional development
 - It offered mechanisms and incentives to create a regional dialogue in fragmented regions (in geographic, institutional and cultural senses)
 - It helped to develop a broader concept for innovation, different from technology transfer, and put this higher on the policy agenda
 - It supported regions to clarify the scene of innovation support infrastructure and to develop actions to rationalise this infrastructure
 - The degree of success achieved by the various regions depended not only on the prevailing starting situation in the regions, but also, and more importantly so, on the appropriateness of management practices in the RITTS process itself

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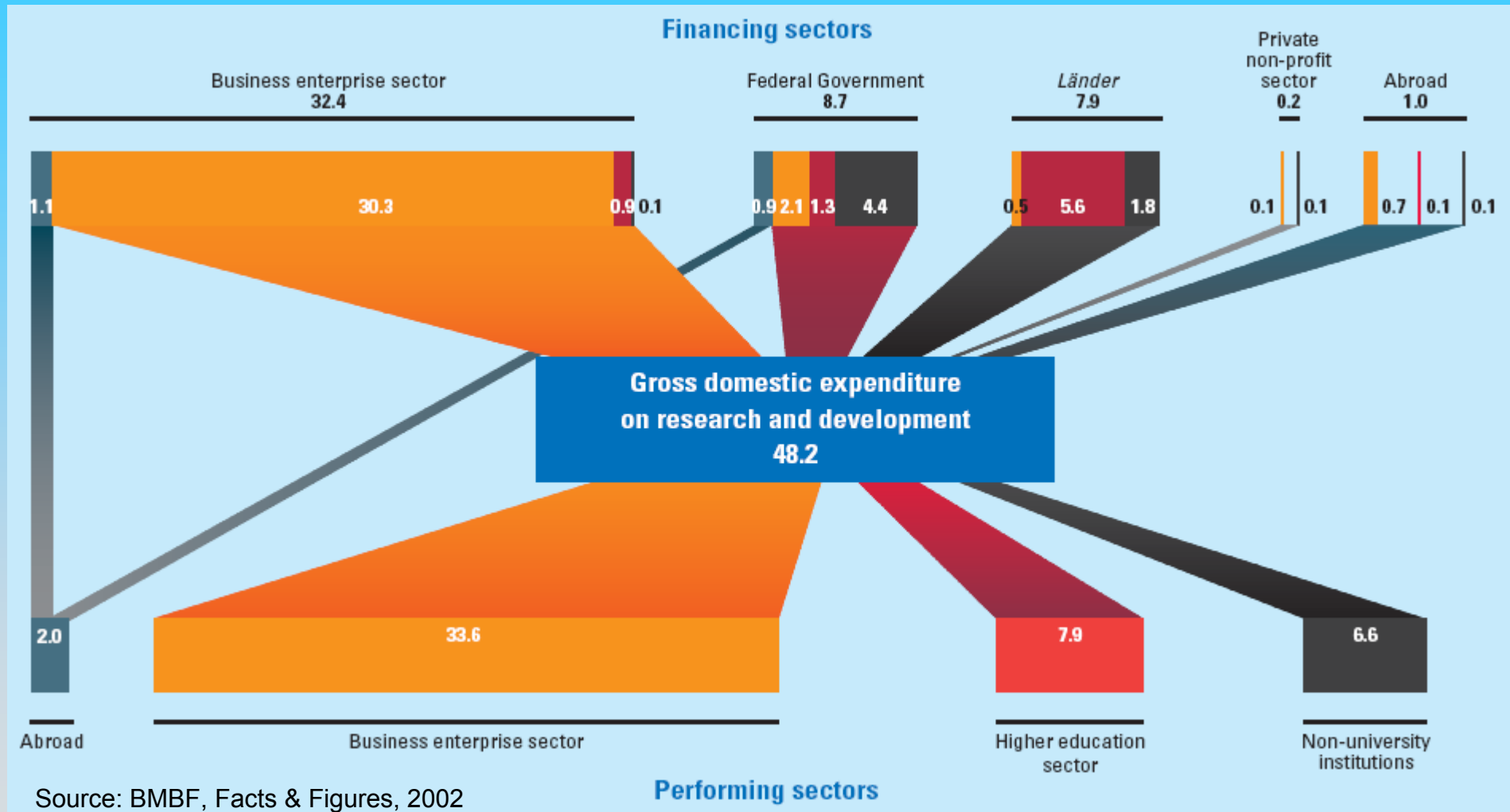
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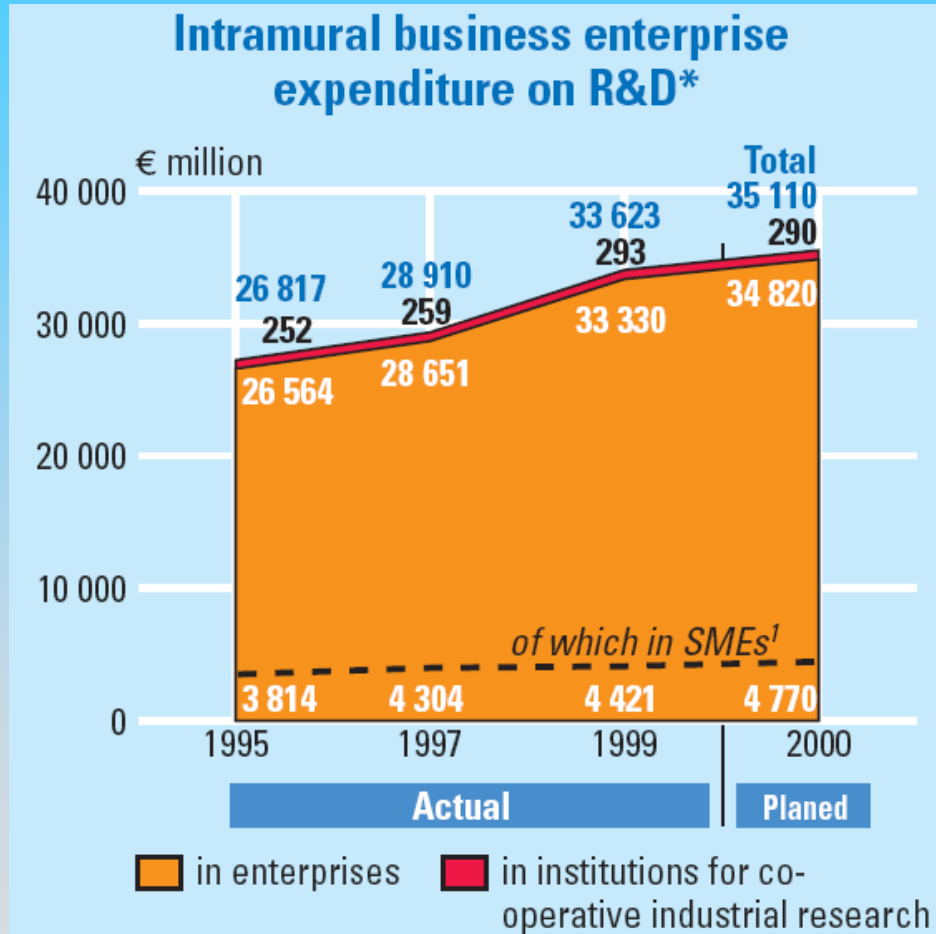
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German R&D expenditure 1999 (bn Euro)



Intra- and extramural business R&D expenditure, Germany 1995-2000



Extramural R&D:

- grew from Euro 4,5 billion (1997) to Euro 6.1 billion (1999),
- of which 65.1 % to business sector, 15.4 % to the public sector, 19.5 % abroad.
- i.e. more R&D cooperation and more outsourcing of business R&D

Source: BMBF, Facts & Figures, 2002

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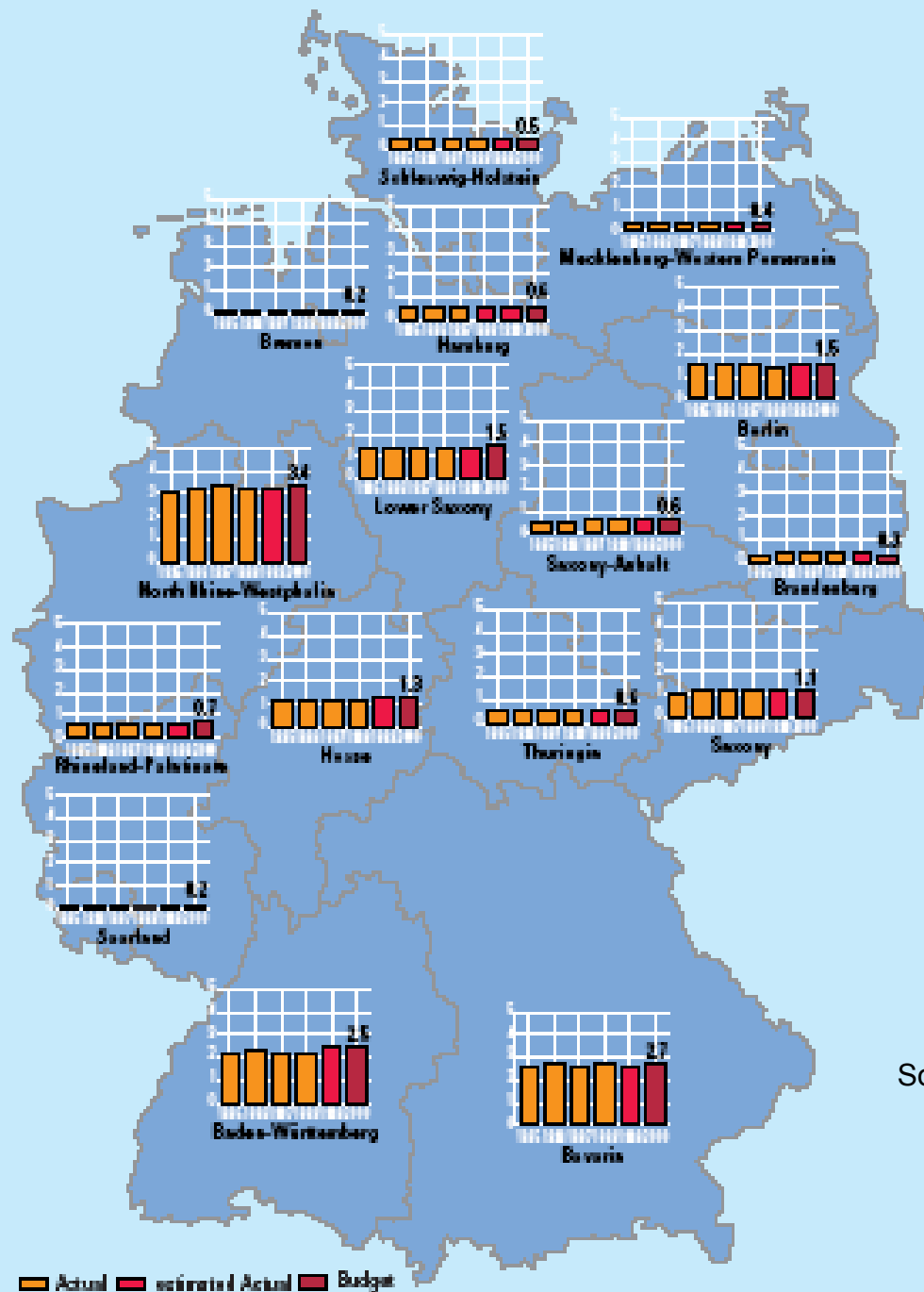
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Science expenditure of Länder and local governments



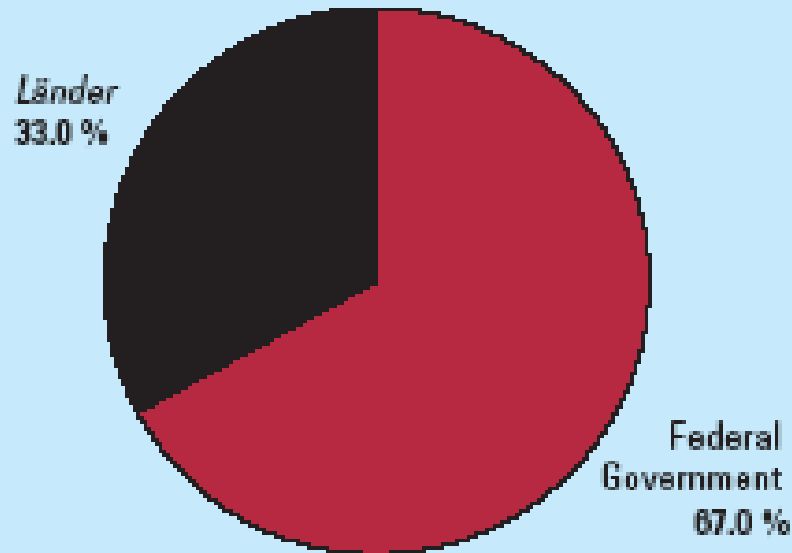
Source: BMBF, Facts & Figures, 2002

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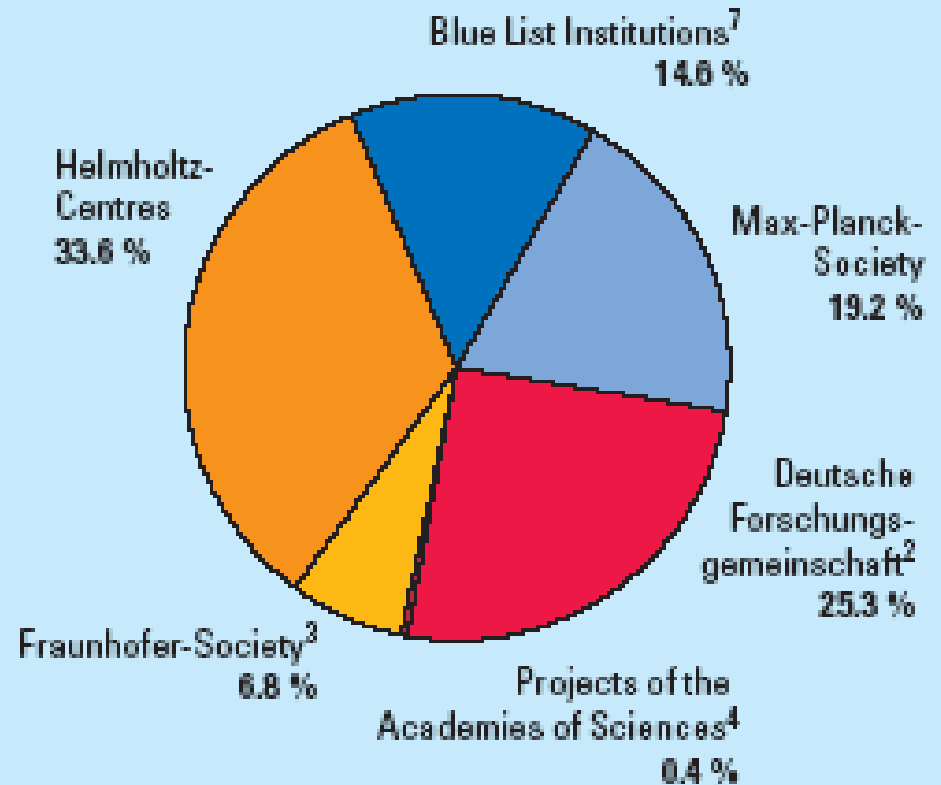
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Joint research funding by Federal and Länder gov'ts in 2001

Financing structure



Breakdown by institution



Source: BMBF, Facts & Figures, 2002



Example: "Innoregio" (Germany 1999-2005)

- The InnoRegio programme aims at stimulating regional co-operation in East Germany as a means for strengthening innovation potential. InnoRegio supports the establishing of co-operation and learning processes. Supported regions shall develop a profile in education, research and economic activities (see www.innoregio.de)
- Target groups: Large Companies; SMEs; research institutes; universities; researchers; graduates; public authorities; individuals
- InnoRegio has 3 stages: (1) Qualification: call for ideas for regional activities, 444 responses (1999); 25 regions were selected. (2) Development: 25 regions develop concepts and projects. (3) Realisation: 19 of the 25 selected for financial support for realisation of concepts until 2005
- Funding: 110 mill. Euro (private investment €50 mill. Euro so far)
- Main indicators for success? Increase in innovation activities, sustainability of regional networks
- **Evaluation?** Not yet, but "monitoring research" on InnoRegio's development. InnoRegio stimulated regional networks; 48 company establishments since 1999; significant potential for regional co-operation in innovation. No evidence so far that innovation output or success was increased, but one should expect a significant type lack between the promotion of regional networks and a measurable result in innovation performance

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Example: Länder regulation and evaluation fostering university-industry collaboration in Baden-Württemberg

- Federal state support (Ministry of Economic Affairs) for some 35 non-university industrially oriented research institutes (e.g. Fraunhofer)
 - evaluation of institutes' research performance and contribution to industrial innovation (1995; 2001); panel's evaluation was based on abroad set of indicators and data collection
 - as a result several institutes were pushed to revise their strategies and research portfolio
- New university law (Science Ministry) concerning 9 universities (2000):
 - regulative stimulation of university-industry collaboration (for exploitation of research universities can engage in private business)
 - increasing industrial income of universities
 - no systematic evaluation of contribution to innovation yet
- Conflicting targets of competing ministries, resulting in increased competition between universities and public non-university research for industrial income - useful?



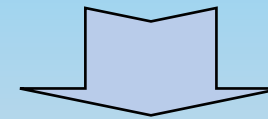
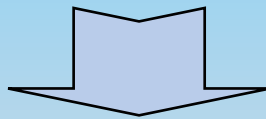
Example: Endogenous regional foresight as a stimulus for profiling (Trento, Italy)

International context

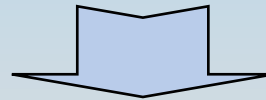
- New regional autonomy
- Increased global competition
- Need for regional specialisation

Regional context Trento

- Autonomy status, but not too certain
- Difficult to motivate interest groups due to lack of economic pressure



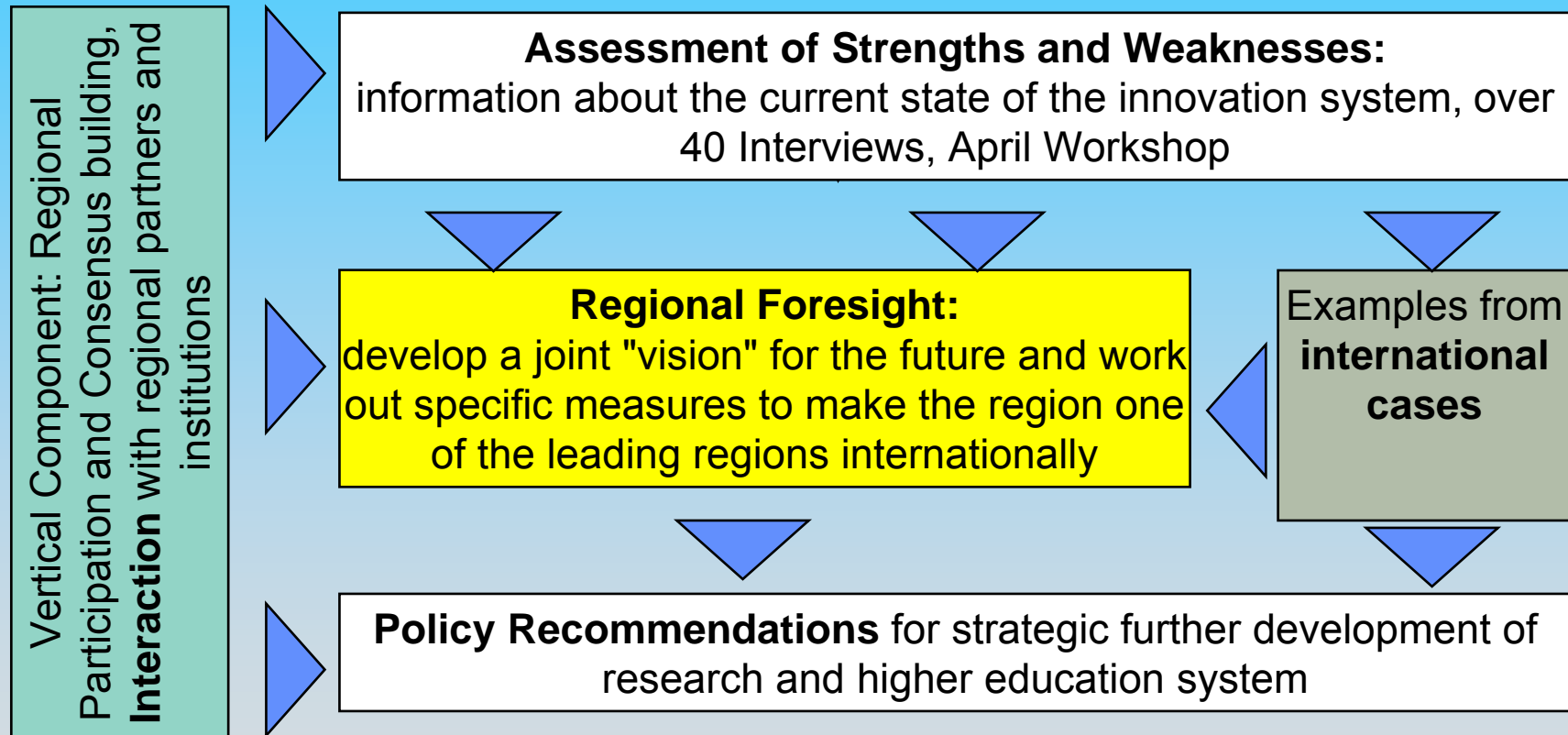
Need for structural policy decisions on a regional level to ensure long-term welfare



Request for strategic intelligence, i.e. evaluation and foresight



Design of Trento Foresight



Conclusions

- There are ample public policies facilitating industry-academia cooperation and regional innovation in Europe
- The provision of public initiatives – offered by national governments, regional authorities, and European Commission – is sometimes complex and not transparent for regional actors, and even contradicting in targets
- In spite of such efforts there are still serious and partly growing regional disparities in innovation performance and growth, across nations and Europe
- Increasingly regions are challenged by global competition: there is a need for the development of internationally attractive and unique research and innovation profiles, as a basis for sustainable economic growth
- So far there we find no systematic, but complex and partly intransparent, though improving policy evaluation practice in the "old EU", which has partly been stimulated by European Commission's requirements. The new EU member states move up on the learning curve
- Strategic regional policymaking aiming at internationally attractive and unique research and innovation profiles would combine policy evaluation with foresight exercises
- There is still no satisfying and update input, performance and impact data on regional research and innovation potentials and results available – irrespective of considerable and relevant efforts (EU Commission; nation states, regions)

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Lessons for Japan?

- Japanese and European/German public policies facilitating industry-academia cooperation and regional innovation difficult to compare:
- Germany as a federal and the EU as a quasi-federal system have to build on the endogenous efforts of regions – national gov't and EU Commission can run facilitating measures like InnoRegio or Fraunhofer Institutes (D) or RITTS (EU): regional authorities and industries have to play the game – and some do quite successful!
- Would more leeway stimulate Japanese regions' endogenous efforts?

Lessons from Japan?

- Japan's strong investment in R&D may serve as a model: Many European gov'ts (e.g. Germany) and also industry don't invest enough in R&D
- The efforts of NISTEP (and partners) to observe, analyse and evaluate the government's investment in R&D, not at least into regional measures, are impressive. In Europe (and Germany) there are also related evaluation efforts, but they are by fare less systematic, due to the diversity of regional governance



Outlook: New modes of governance for innovation: systemic instruments

- A **holistic concept of research and innovation policy**, keeping in mind the inter-relation of different policy areas, fostering cluster approaches etc.
- Taking into account the **systemic nature of research and innovation**, including the notion of complex, non-linear interaction
- **Cutting across subsystem borders** and superseding tunnel visions and dead-locks of narrow negotiation arenas
- **Government** and administration would proactively **mediate** and facilitate cross-sectoral linkages and help to create “new spaces” for “**new combinations**”
- Elaborated forms of **institutionalised co-ordination**, e.g. between various ministries, the European level and the national and regional level
- Thereby government and administration would use **strategic intelligence**: information sources and explorative and analytical tools, like performance measurement, benchmarking initiatives, evaluation studies, technology assessment, or **foresight exercises**

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Reading/links

- European Commission: <http://trendchart.cordis.lu>
- BMBF, Facts & Figures, 2002 (http://www.bmbf.de/pub/facts_and_figures_research_2002.pdf)
- Smits, R./Kuhlmann, S. 2004: The rise of systemic instruments in innovation policy, in: International Journal of Foresight and Innovation Policy, 1

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