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# HETEROGENEOUS COOPERATIONS - NEW FORMS OF RESEARCH COLLABORATION IN THE GERMAN INNOVATION SYSTEM

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Prof. Dr. Knut Koschatzky

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**Prof. Dr. Knut Koschatzky**

Telefon +49 721 6809-184  
knut.koschatzky@isi.fraunhofer.de

Competence Center Politik und Regionen  
Fraunhofer-Institut für System-  
und Innovationsforschung ISI  
Breslauer Str. 48  
76139 Karlsruhe

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# Changes in innovation systems

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- Due to the dynamic character of innovation processes, also **innovation systems have to continuously adapt** to new challenges and competitive change.
- Although path dependency results in quite stable organizational structures over a certain period of time, **organizations itself and interfaces between them change** more frequently.
- Changes induced by the increasing globalization since the early 1990s and the increasing complexity and interrelatedness in innovation processes had also impacts on the German innovation system.
- **New organizations** emerged, **new forms of governance** were introduced (e.g. in the higher education system), **new policies, instruments and programmes** were implemented (e.g. cluster promotion, Hightech Strategy).
- Also **interfaces and transfer bridges** change: Collaborations between **heterogeneous partners** (i.e. belonging to different sub-parts of an innovation system) developed and the modes of collaboration between them changed.

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# Changes in the higher education sector

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- The **range of tasks of universities** has increased significantly without a corresponding increase in allocated financial resources.
- In the context of increasing **university autonomy**, new public management principles have been applied to the universities and self-control has been enhanced.
- New organizational possibilities have been opened which allow universities to act as **strategic actor** by their own.
- In this context, the emergence of **"entrepreneurial universities"**, the **"boundary-spanning roles"** of new university units (Youtie and Shapira, 2008) and the **"third role" of universities**, i.e. their active contribution to regional development (Gunasekara 2004;. Westnes et al 2007) are being discussed.

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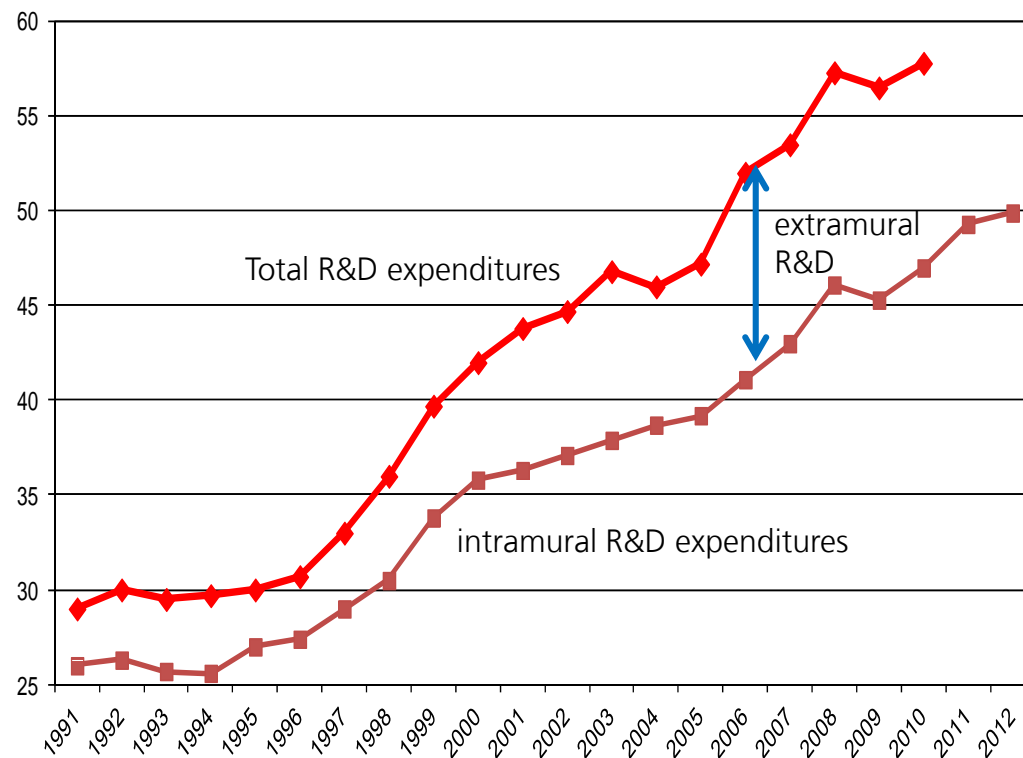
# Changes in the industrial sector

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- In the course of globalization and the increasing science orientation in technology development, the **complexity in technology and product development** increases further.
- Own entrepreneurial **resources** (knowledge, capital) **are often insufficient** to master this complexity.
- This results in **changes in the interface between science and industry** in the German innovation system - (large) companies are looking for access to long-term strategic research.
- Universities and non-university research institutions are attractive **research partners** in this context.

# Structural changes in industrial R&D spending in Germany

Bill. Euro



- Since the mid 1990s, total R&D expenditures and the share of external R&D expenditures has increased (outsourcing)
- Other firms and universities profited most
- Most of industrial funded R&D is short-term and market-oriented development
- Only recently, the tendency towards more long-term oriented research increased

Quelle: Stifterverband Wissenschaftsstatistik, diverse Jahre

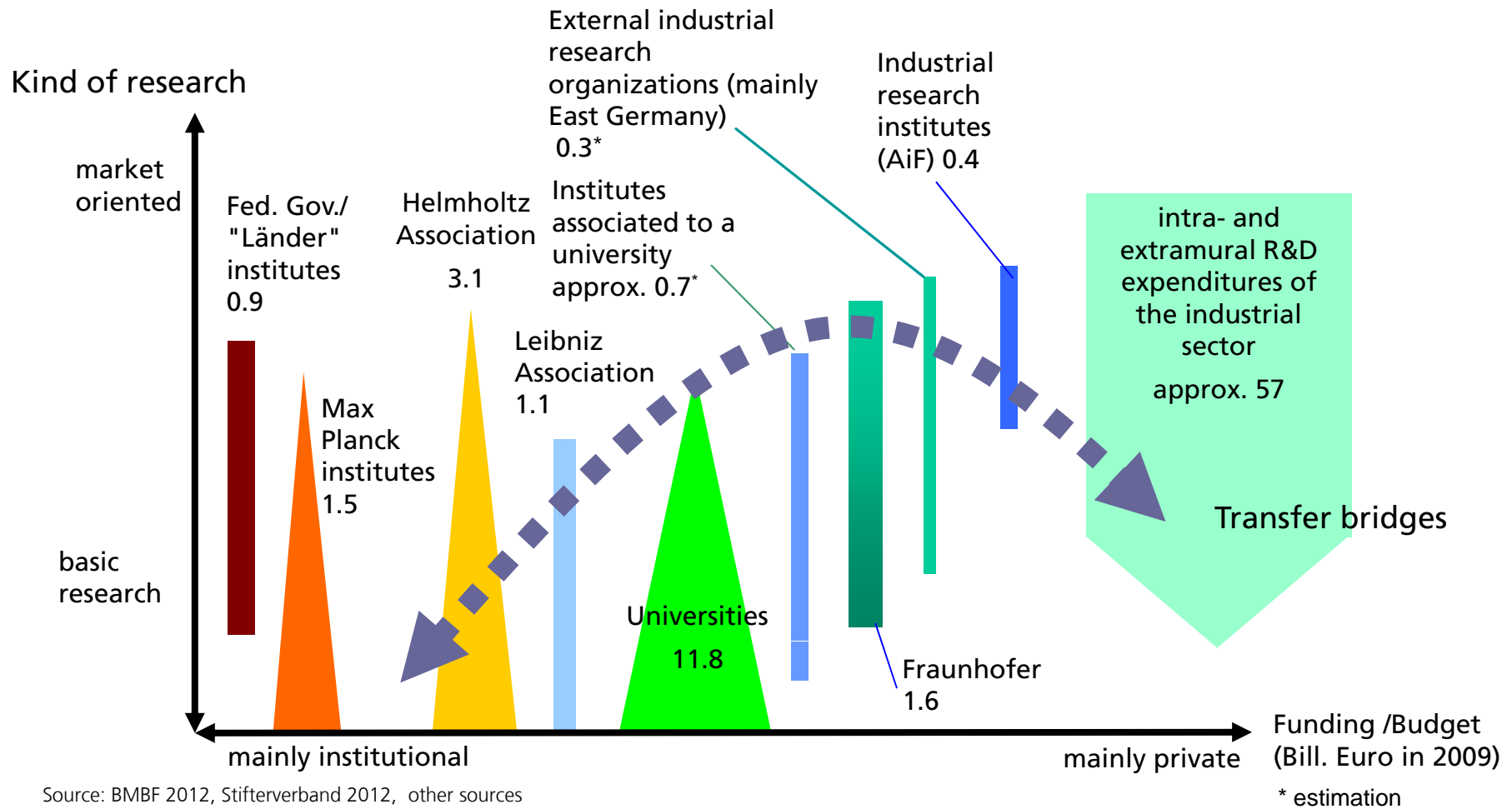
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# New tendencies of research cooperation between universities and industry

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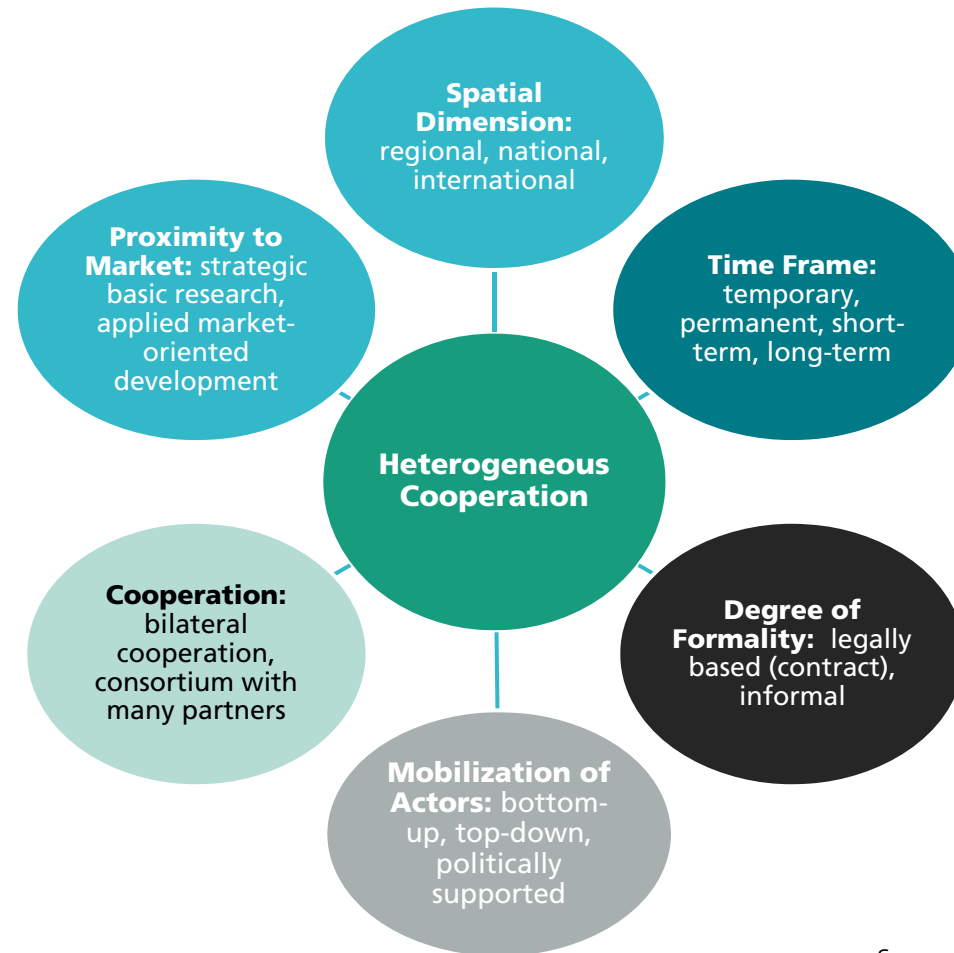
- **Significant change of the role of universities** in innovation systems: entrepreneurial behaviour of universities, entrepreneurship education, targeted spin-off promotion programs play an important role.
- Long-term, stable institutional structures to organize research and technology **transfer** are more and more replaced **by flexible solutions** and problem-related research cooperations between science and industry.
- Implementation of **Public-Private Partnerships** currently discussed in policy and policy research (e.g. TIP Activity on Opportunities and Options for Public-Private Partnerships at the OECD).
- **Examples** are: Industry-University Cooperative Research Centers (IUCRCs), Centers of Excellence (CoEs), Competence Research Centers

# The German research system



# Starting points for partnerships between heterogeneous partners

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Source: own draft

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# New strategic research collaborations in the German innovation system

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- In particular large enterprises are seeking increasing access to longer-term strategic research and are increasingly **establishing strategic R&D capacities** in cooperation with universities, non-university research institutions and other enterprises.
- Already in **2008, over 50 collaborations** in different legal forms existed in Germany, which can be brought together under the generic term of new strategic research cooperations between science and industry.
- Most of these cooperation models take place between **universities and large enterprises**; there are also examples for collaboration between several small and medium-sized enterprises (Mittelstand) and a university.

# Emergence of (new) cooperation models in Germany (selection)

<b>Institution</b>	<b>Foundation</b>	<b>Partner(s)</b>	<b>Legal Form / Status</b>	<b>Employees</b>	<b>Time Limitation</b>
<b>DFKI</b> (Center for Artificial Intelligence)	1988	BMBF, 3 regional governments, 5 MNCs, 2 SMEs	Non-profit limited company	208 scientists	Unlimited
<b>T-Labs</b> (Telekom Laboratories)	2005	Deutsche Telekom, Technical University Berlin	Associated institute to a university	75 scientists	5 years with possibility of extension
<b>CaRLa</b> (Catalysis Research Laboratory)	2006	BASF, University of Heidelberg	Cooperation-Agreement	13 scientists	5 years with option of extension
<b>S- Lab</b> (Software Quality Laboratory)	2005	University of Paderborn, 4 local SMEs, 1 non-local SME	Scientific facility of the university	15 scientists	First of all 3 years

Source: Koschatzky et al. 2008

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# Public support of heterogeneous cooperations in Germany

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- In its report 2009, the Expert Commission for Research and Innovation (EFI) suggested that strategic cooperations between industry and research organizations should be encouraged and "active political support should be provided for further partnerships" (EFI Report 2009, p. 41).
- Based on this recommendation, BMBF formulated and implemented the funding initiative **"Research Campus" (Forschungscampus)** which is part of the Hightech Strategy 2020.
- Its objective is to promote collaboration between partners from industry and research organizations by **combining resources** in order to **develop new research fields** in a **middle to long-term perspective** in the way of **public-private partnerships** located **at the campus of a university or research institute**.
- **Strategic pre-competitive research** should be strengthened and **leverage effects** by public funding for an increased private investment be created.



- **Major characteristics:** Bottom-up approach, competitive selection of projects by a jury, activities include training and acquisition of young scientists, research fields should be complex and should have potential for radical innovation, partnerships should include SMEs and should be at eye level between the different partners.
- Preparation and main phases will be supported **up to altogether 15 years** with a **maximal amount of 2 mill. Euro per year**.
- In September 2012, **ten ResearchCampus projects** were selected: Digital Photonic Production, **Aachen**; Electric networks of the Future, **Aachen**; Connected Living, **Berlin**; Mathematical Optimization and Data Analysis Laboratory MODAL AG, **Berlin**; Sustainable Energy and Mobility Development by linking intelligent Networks and Electromobility "Mobility2Grid", **Berlin**; INFECTOGNOSTICS, **Jena**; STIMULATE - Solution Centre for Image Guided Local Therapies, **Magdeburg**; Mannheim Molecular Intervention Environment (M2OLIE), **Mannheim**; ARENA 2036 - Active Research Environment for the Next Generation of Automobiles, **Stuttgart**; Open Hybrid LabFactory, **Wolfsburg**.

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# Conclusions

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- Heterogeneous cooperations (public-private partnerships) have a **longer history in other countries** than in Germany.
- They are a clear indication (besides other developments) for **reorganizing the division of labour in strategic R&D** between industry and the research sector.
- Transfer interfaces become more flexible and the new modes of collaboration reflect the **changing role of universities** in the German research system.
- These kind of cooperations are a **'temporary marriage'**. They must demonstrate an added value against other possibilities of organising research activities.
- The ResearchCampus programme by BMBF is an **attempt to establish this form of collaboration in Germany**.
- Based on ongoing experiences made in the different ResearchCampus projects, but also by exploiting international experiences, it has to be evaluated whether these strategic PPPs become a **new and sustainable element in the German research and innovation system**.

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# Thank you for your attention!

Contact: [knut.koschatzky@isi.fraunhofer.de](mailto:knut.koschatzky@isi.fraunhofer.de)



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