VALIDATION OF THE INNOVATION POTENTIAL OF PUBLIC RESEARCH

Workshop "The Science Systems in Canada and Germany: Structures, Policies and Changes" - 28 November 2013

Prof. Dr. Knut Koschatzky

Fraunhofer ISI

Prof. Dr. Knut Koschatzky

Phone +49 721 6809-184

knut.koschatzky@isi.fraunhofer.de

Competence Center "Policy - Industry - Innovation"
Fraunhofer Institute for Systems and
Innovation Research ISI
Breslauer Strasse 48
76139 Karlsruhe
Germany

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Distributed innovation processes

- The recent understanding of innovation as an interactive and systemic process can also be interpreted as a **distributed knowledge sourcing and combining process between different agents**.
- Knowledge generation and implementation processes are supposed to result from **social interaction** between economic actors.
- Distributedness of innovation depends on different influential factors: the ***modes*** of interrelationships between agents (knowledge base and specialization), the ***dynamics*** in the distribution patterns of the agents (changes in the distribution patterns), and the ***scales*** which address the levels of innovation (incremental steps <--> fundamental changes) (Coombs et al. 2003, p. 1126).
- The advantages of distributedness depend on the **absorptive capacity** of organizations (Cohen/Levinthal 1990) and on a proper **gatekeeper function** in organizations (Tushman/Katz 1980).

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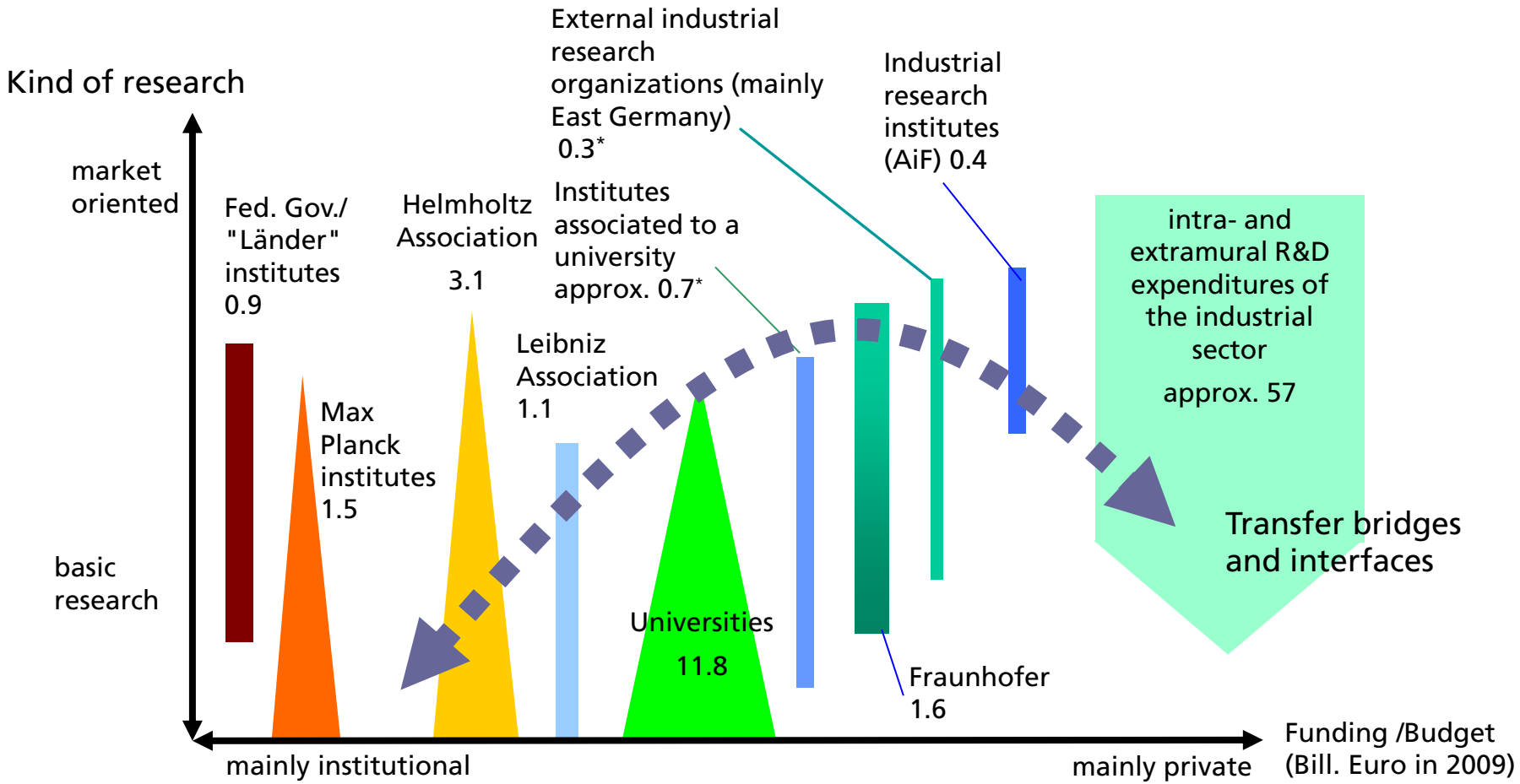
The German research system



Source: BMBF 2012, Stifterverband 2012, other sources

* estimation

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Forms of Knowledge and Technology Transfer

- **Collaboration in clusters and networks**
- Committees
- Conferences
- Consulting
- Contract research
- Cooperative research
- Demonstration
- Education, further educat.
- Expert reports
- Fair presentations
- Firm formation
- Informal meetings
- Internet platforms
- Lectures by practitioners
- Licences
- Master and PhD theses
- Patents
- Personal talks
- Personnel mobility
- Publications
- Science sponsoring
- Spin-offs
- **Strategic research collaborations (PPPs)**
- Use of equipment
- **Validation**
- Visits
- Workshops, seminars

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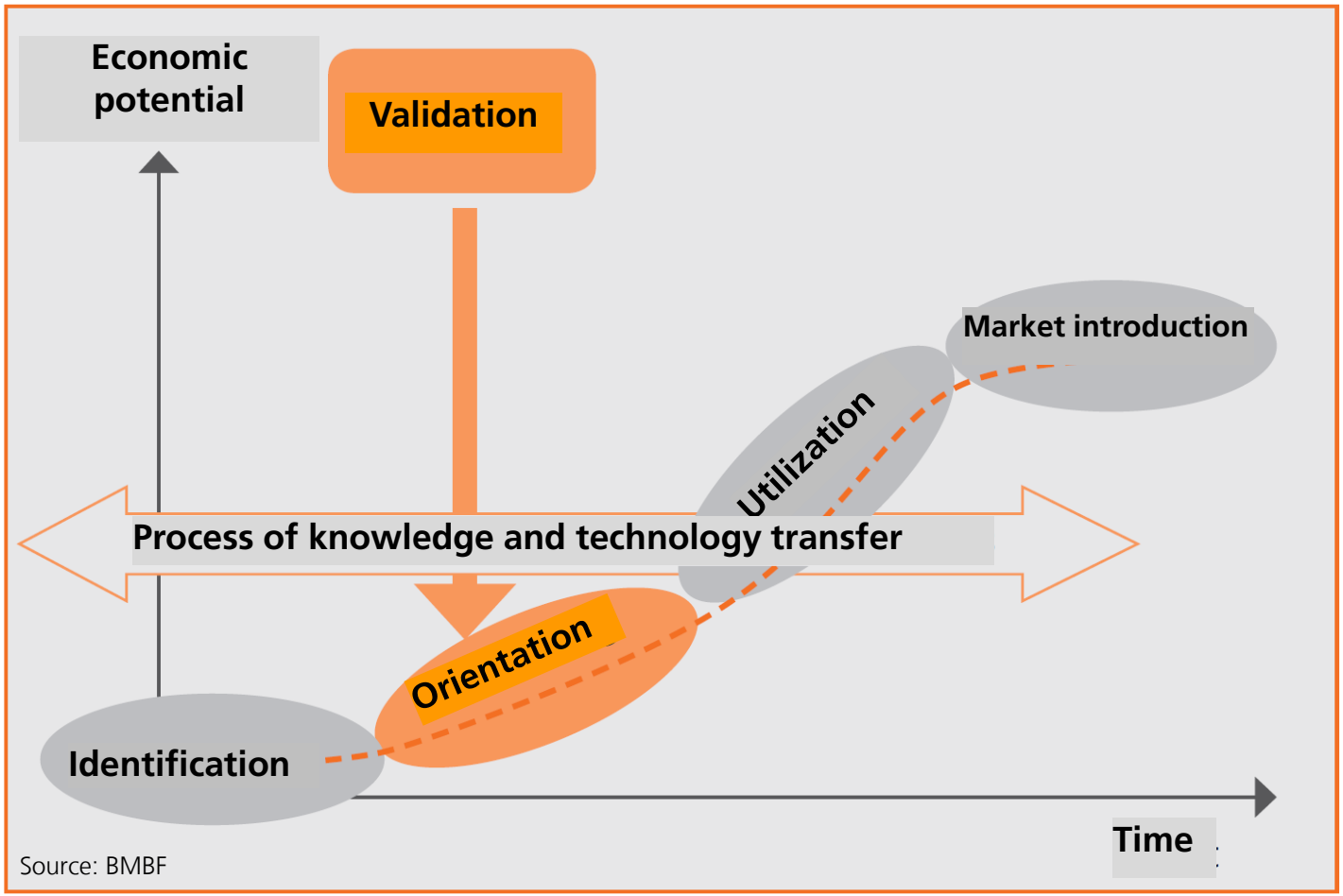
The "Valley of death" in technology transfer



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The VIP approach

- VIP (Validation of the innovation potential of scientific research) started in May 2010. Applications were possible until the end of June 2012.
- Projects were selected by a jury (competitive approach).

Core elements:

- Funding should be oriented towards the early, high-risk phase of validation projects.
- Funding is not confined to specific themes and topics should be cross disciplinary.
- Especially those projects should be encouraged that may cause so-called jump innovations (excellence approach).

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The VIP approach

Project requirements

- Projects should **build on present research results** and develop them further in the direction of application, i.e. adjust or verify its feasibility.
- Projects can be applied **alone or in collaboration with several research partners**.
- **Industry collaborations are excluded**, but openness in commercialization is required, i.e. projects should be funded in the early stage, in which there is no R&D cooperation with industry and firm formation is planned or implemented.
- The support by **innovation mentors**, i.e. experts who have experience in innovation processes, is mandatory for all projects.
- Funding will be provided for a period of **up to three years**. The amount of funding per project should **not exceed the sum of € 500,000 per project per year** (i.e. a total of € 1.5 million).

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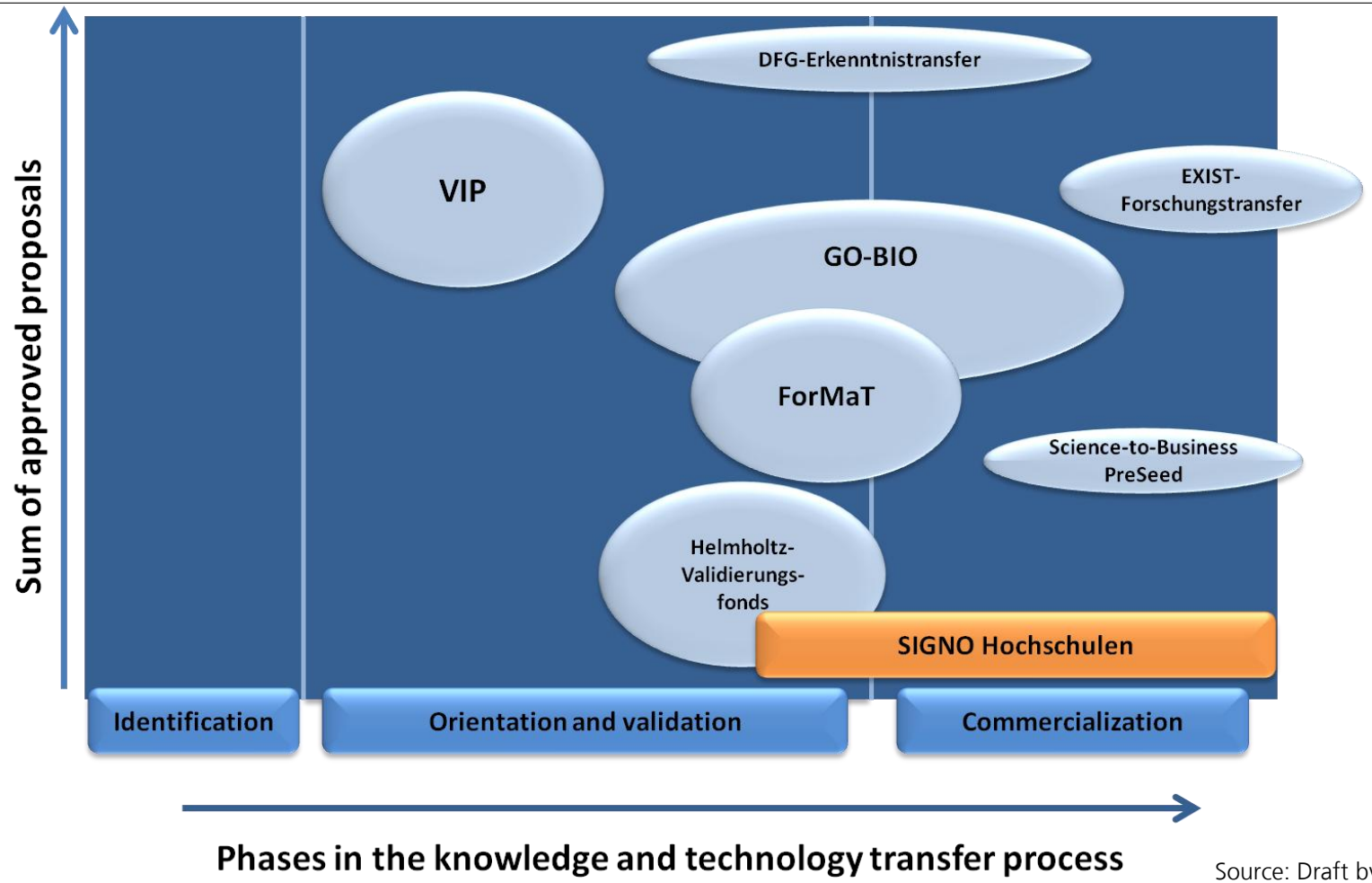
VIP in the context of other German programs



Source: Draft by Fraunhofer ISI

* Size of ellipses = Funding volume per project

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VIP: A first assessment

- The VIP approach is **new** in Germany.
- The number of applications shows that there is a **need for such program**.
- The phase model highlights the **clear distinction between validation and commercialization**.
- Projects should be **risky** and should have quite a **high need for funding**.
- In **comparable programs of other countries** funding starts later in the process with often a lower amount of funding.
- The interface with regard to commercialization is less developed in VIP, because the intention is to **incorporate the idea of validation early in basic research activities** where different "exist" options exist.

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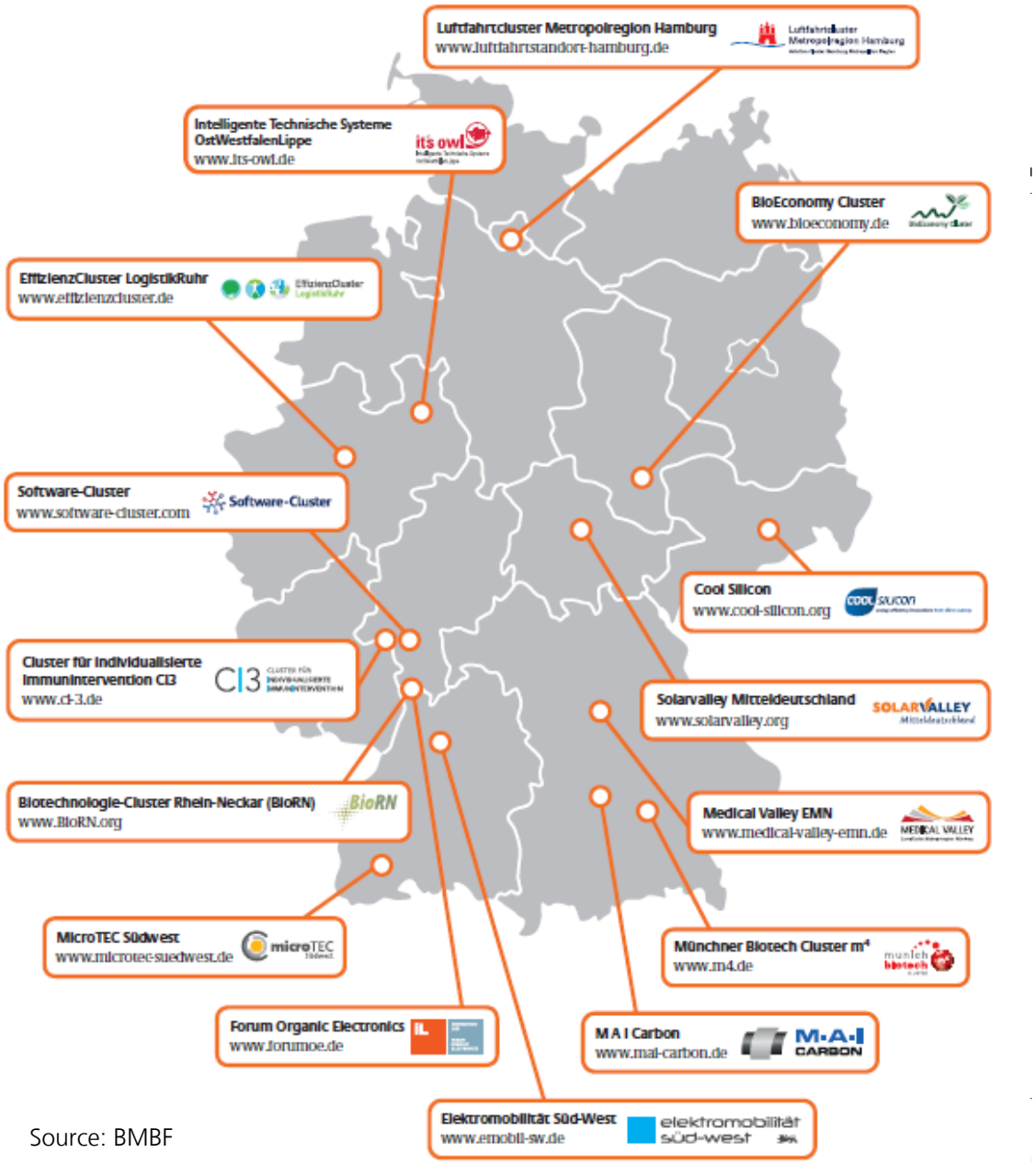
Leading-edge clusters

- Since 2006, the "High-Tech Strategy" aims to put Germany at the top of the world's ranks in tomorrow's most important markets.
- One of the key elements of this strategy is the promotion of leading-edge clusters.
- Three contest rounds in a sequence of one to one and a half years.
- In each round: up to five clusters can be selected which receive funding up to 200 million Euro.
- As part of the High-Tech Strategy, the "Pact for Research and Innovation" aims to strengthen the support for the jointly funded large German science and research organizations.



Source: BMBF

ResearchCampus

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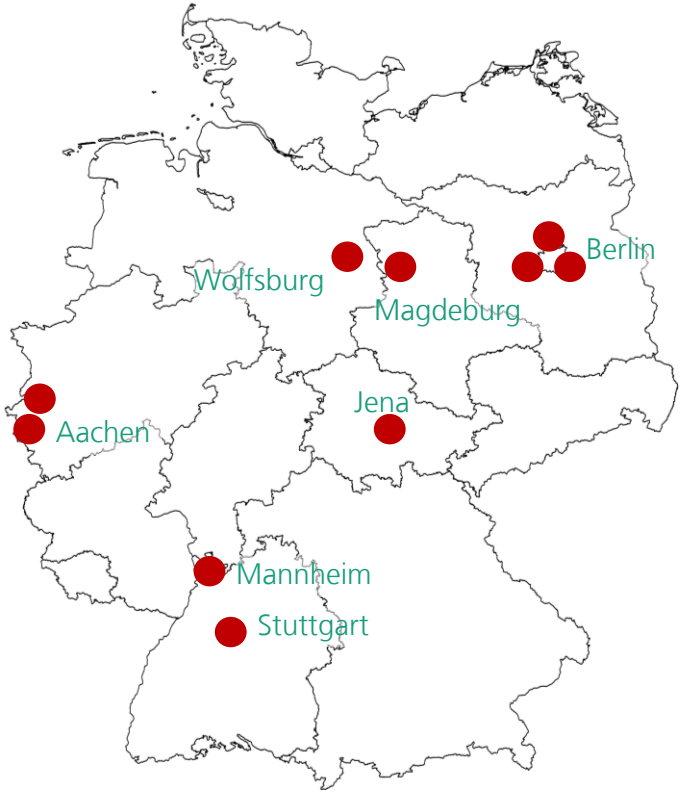
Three distinct characteristics:

- **Proximity** – the bundling of research activities and competencies at one location, as possible on a university or public research campus,
- The medium- to long-term **adaptation of a specific research topic**, ideally in the frame of a research programme,
- A mandatory **public-private partnership.**

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.



Conclusions

- The **validation** of the innovation potential of public research plays a **prominent role** in the German innovation policy (Hightech Strategy 2020).
- **Different approaches** are used besides the "classical" transfer instruments and channels.
- The **VIP** approach is an example for a program which tries to implant the idea of validation in early phases of basic research and to create a **validation culture** in the German public research sector.
- **Leading-edge cluster** promotion tries to develop strong interfaces between basic and applied research in universities, institutes and firms in technological fields which are of high relevance for Germany's future competitiveness. **Validation is a strong element of commercialization** and is managed through market needs.
- The **Forschungscampus** responds to the need of developing long-term research agendas in firms and to create flexible research units in close collaboration with universities and other research partners. **Validation** takes place on a **longer time perspective** within a jointly formulated research agenda.

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Thank you for your attention!

Contact:
knut.koschatzky@isi.fraunhofer.de

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Innovation system: Definition and activities

Systems of innovation are defined by "…all important economic, social, political, organizational, institutional, and other factors that influence the development, diffusion, and use of innovation" (Edquist, 2005, p. 182).

Activities of an innovation system are

- Provision of research and development
- Competence building (e.g. education, training, learning…)
- Formation of new product markets
- Demand side induced product development
- Creation of new and change of existing organizations
- Internal and external networks for learning and innovation
- Creation of new and change of existing institutions (tax regulations, environmental regulations, IPRs…)
- Incubation and firm formation activities
- Innovation financing
- Consultancy and transfer offers

based on Edquist (2005, p. 190/191)

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Transfer Activities in Germany

Transfer Organizations

- Transfer Offices at Universities and Universities of Applied Sciences
- Patenting and Licensing Offices at Universities (PVA)
- Max Planck Innovation as Centre of Technology Transfer for Max Planck Institutes
- Fraunhofer Society
- Otto von Guericke Association
- External Industrial Research Organizations (mainly Eastern Germany)
- Transfer Offices at Helmholtz Association and other research organisations
- Steinbeis Transfer Centers at Universities of Applied Sciences

Transfer Indicators

Selected indicators of knowledge and technology transfer in international comparison

		DE	FRA	GBR	AUT	JAP	KOR	USA
Contract research	R&D activities at universities financed by industry (2009, in %)	14,2	1,6	4,5	5,7	3,0	14,2	5,6
	R&D activities at non-university research institutes financed by industry (2009, in %)	10,8	6,8	9,5	9,3	0,8	4,2	2,7
Innovation cooperation	Share of innovative firms which cooperate with universities (2004, in %)	53,2	25,5	32,7	57,6	n.a.	n.a.	n.a.
	Share of innovative firms which cooperate with non-university research institutes (2004, in %)	25,9	18,4	24,7	30,1	n.a.	n.a.	n.a.

Source: OECD: MSTI 5/2010; Eurostat CIS 2006

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Public support of heterogeneous cooperations in Germany

- 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 **"Forschungscampus" (Research Campus)** 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.**

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- **Strategic pre-competitive research** should be strengthened and **leverage effects** by public funding for an increased private investment be created.

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ResearchCampus

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Campus	Subject	Location
INFECTOGNOSTICS	Development of a technology portfolio which enables a highly-efficient and rapid on site proof of infection agents and microbiological contaminations.	Jena
Mannheim Molecular Intervention Environment – M2OLIE	Long-lasting research strategy with the aim to develop a molecular medical intervention environment regarding cancer therapy.	Mannheim
Mathematical Optimization and Data Analysis Laboratory – MODAL AG	Research on data based modelling, simulation and optimization of complex processes in logistics and medical technology. Main objective: optimization of nets, systems and related processes for instance regarding rail traffic, petroleum gasoline maintenance or medical diagnostic technologies.	Berlin
Open Hybrid LabFactory	Research focus on hybrid light construction; development of new process technologies aiming at the construction of innovative large-scale and functional light construction components.	Wolfsburg
STIMULATE – Solution Centre for Image Guided Local Therapies	RC develops and optimizes technologies for the screening of minimal-invasive methods in medicine; the focus is on important widespread diseases in the fields of oncology, neurology and cardiovascular diseases.	Magdeburg

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ResearchCampus

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Campus	Subject	Location
ARENA 2036 – Active Research Environment for the Next Generation of Automobiles	Support of sustainable future mobility and production; multifunctional composite materials	Stuttgart
Connected Technologies	Overall subject: Smart homes and networked living of tomorrow; development of a basis for technologies, modes of interaction and business models for new application scenarios in the home environment.	Berlin
Digital Photonic Production	Laser application in production and construction of composites related to future areas like mobility, energy, health and ICT.	Aachen
Electrical Nets of the Future	Environment friendly sustainable energy technologies; research on direct current voltage for power transmission.	Aachen
Sustainable Energy- and Mobility development through coupling of intelligent nets and e-mobility	Integrated research on e-mobility by coupling energy technology approaches with mobility- and urban concepts.	Berlin

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