Development of the German Research and Innovation Policy towards networks and clusters

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Structure of the presentation

- Japan and Germany, comparing data
- Development of the Research Policy in Germany
- kompetenznetze.de
- InnoRegio: special program for East Germany
- Examples/ best practice
- Lessons learned

Japan-Germany: Comparing Data (1)

	Germany	Japan
Population (Mio)	82	127
GDP (Bio US $, PPP)	2195	3440
R&D-Budget of Gov. (Bio Euro)	16	27
Researchers (total)	240.000	740.000
Researchers in public Institutes	39.000	31.000
PhD-graduations per year	12.000	6.500
Patents (registered worldwide)	92.000	218.000
Triade Patents	5700	10.200
Scientific Publications (% OECD)	9,2 %	10,3%
Scientific Citation Rate (% OECD)	9,2 %	7,2 %

Japan-Germany: Comparing Data (2)

	Germany	Japan
know-how-intensive goods:		
- Techn. Paym Income (Bio USD)	13,9	9,8
- Techn. Payment (Bio USD)	20,6	4,1
- Trade-balance (Bio Euro)	+ 90	+ 200
- World market share	14%	12%
Economic competitiveness:		
- World Compet. Report (IMD)	10	11

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Change of R&D-policy

old	new
+ Focus on scientific-technological goals + support of single institutions (institutional orientation)	+ Focus on innovation goals + support of network structures (structure orientation)
Evaluation by scientific-technological criteria Promotion of good, but isolated projects	Evaluation of strategic and structural success criteria Promotion of networks, selected by competition
Presentation of single R&D results	Active marketing of competence

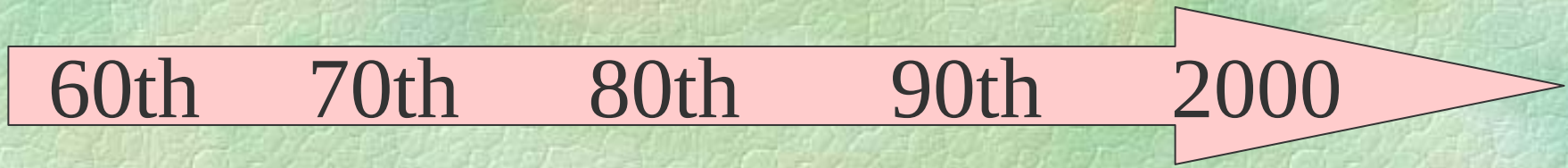
Research Promotion Policy in Germany

Networks/Clusters

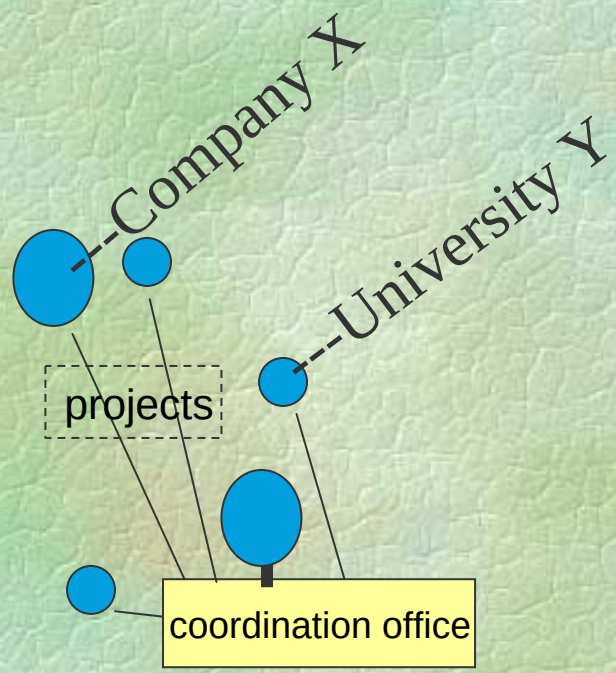
Leading Projects →

Co-operation Projects →

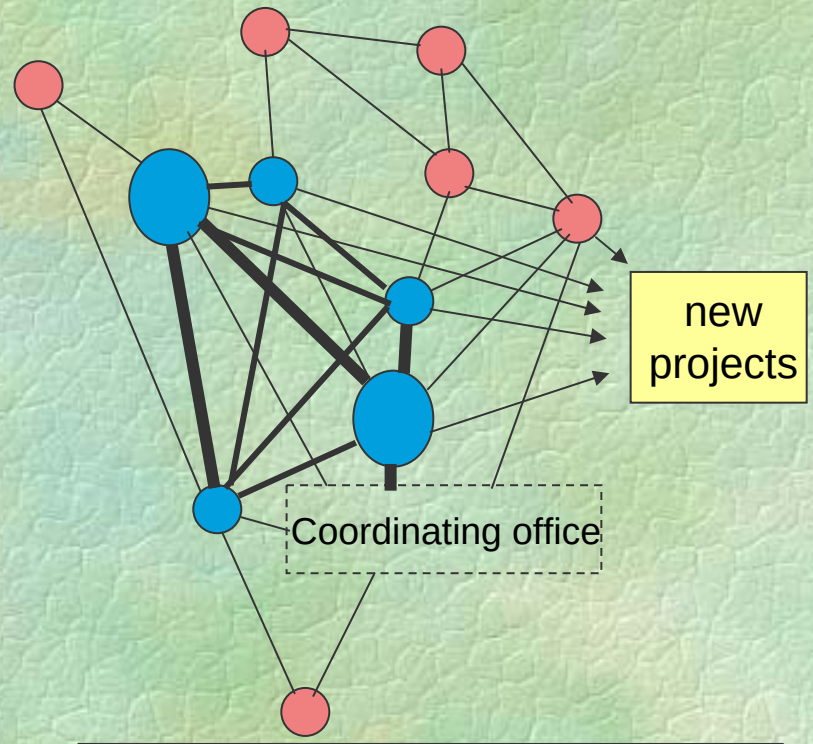
Single Projects



From single projects to networks



Cooperation Project



R&D in Networks

Important:: network structure and R&D projects should be funded separately !

Results of a 10-country comparative study

Networks overcome the weakness of traditional innovation systems

- a lack of co-operation between university/research sector and industry
- scattered and uncoordinated support activities
- science-industry-interface not clearly defined
- concentration of innovative activities in metropolitan areas
- brain drain due to scientific hot spots of other countries
- low mobility rate and little transfer of knowledge

prevalence of a systemic imperfection outstanding rationale for initiating networking policies.

Networks of Competence improve structures

Innovation Orientation

- **Value chain: closing gaps**
- **Supporting cooperation**
  - **working groups**
  - **exchange of experience**
  - **increasing flexibility**
  - **support of spill-over effects from science to industry and vice versa**
- **Sharpening the regional profile**
  - **marketing**
  - **reputation management**
  - **public consultancy**

Location Orientation

Definition of competence-networks

Criterion 1: **Thematic, strategic, and regional focus**
- common guidelines, targets

Criterion 2: **Integrative approach**
- scientific and technological know-how
- educational offers
- innovation-friendly general framework

Criterion 3: **Interdisciplinarity and cooperation**
- close communication and interaction within the network
- cooperation with external partners

Criterion 4: **International attractiveness**
- products leading to international markets
- international contacts

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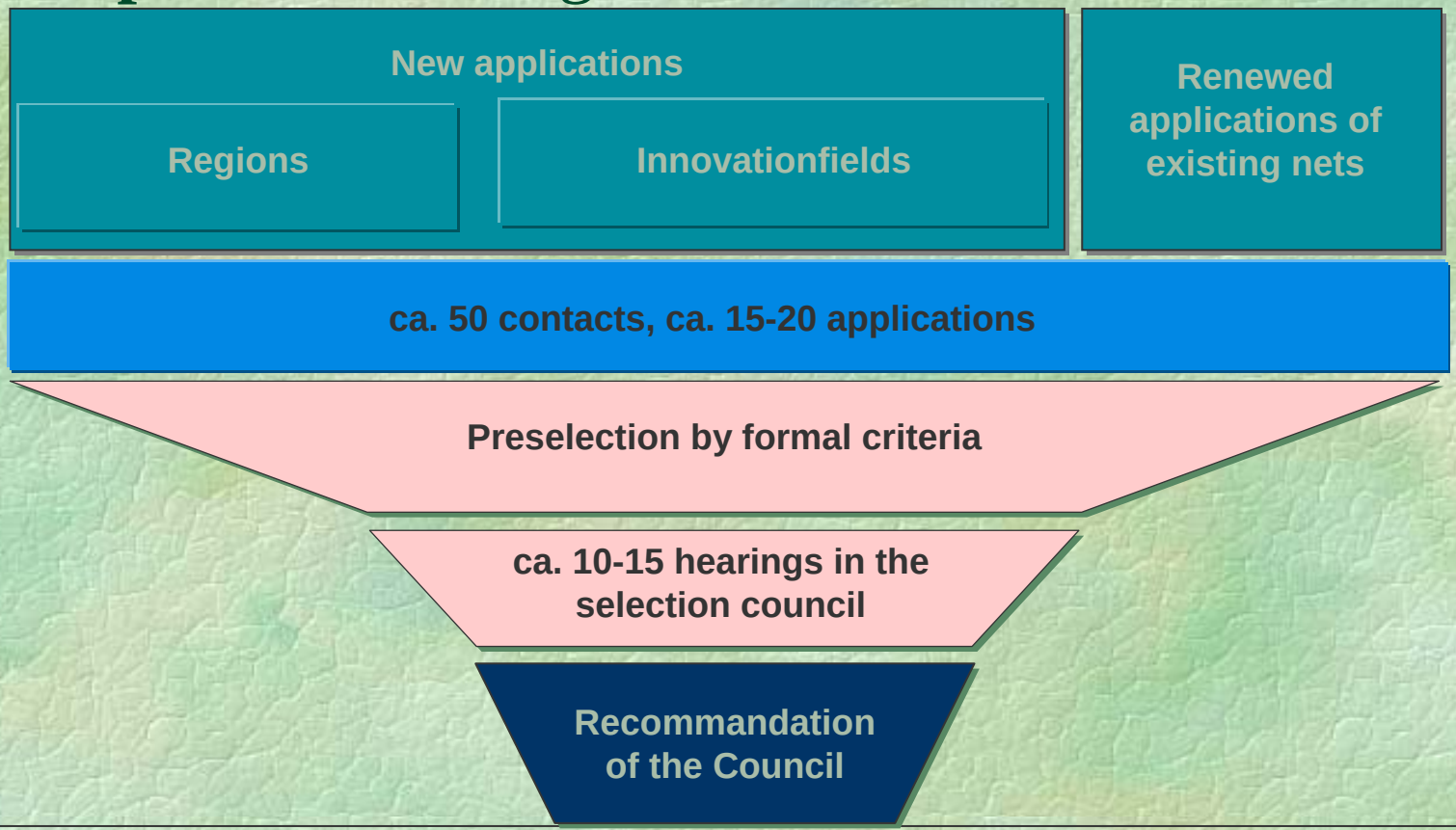
Selection of Networks of Competence

The principle: Bottom-up through a competition process
The goal: top networks with permanent quality control
The process: leading to the “club of the best”

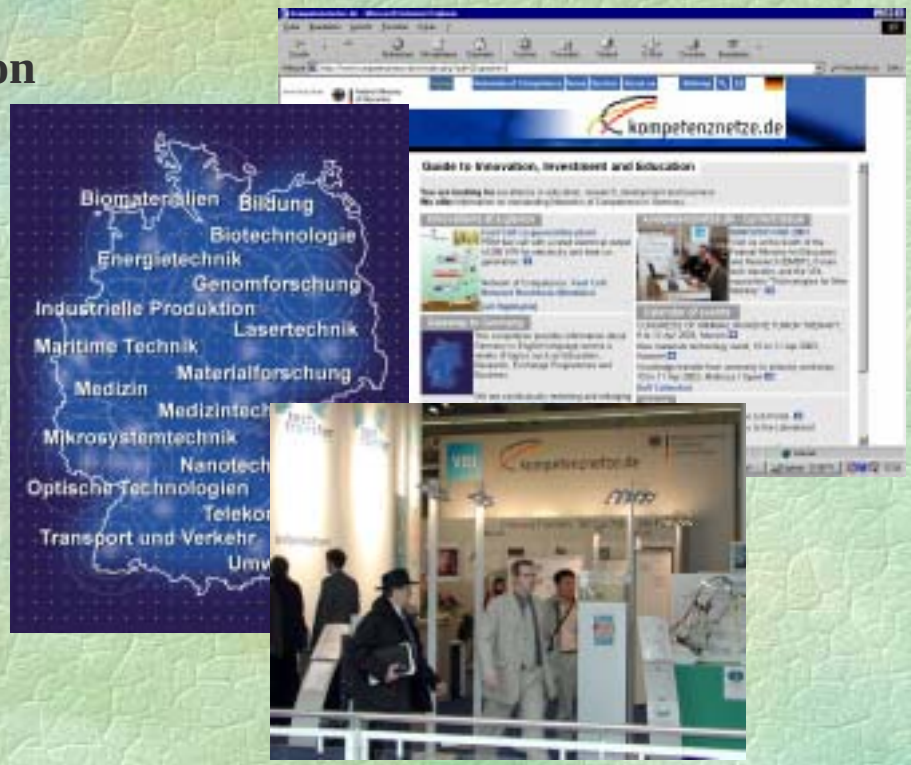


Kompetenznetze.de

The best networks of competence are presented at
kompetenznetze.de

kompetenznetze.de

- **aims:**
  - **identify strategic fields of innovation**
  - **offer leading know how and techn.**
  - **Techn.-Transfer and marketing**
  - **promote internationalization**
- **through**
  - **information**
  - **communication**
  - **cooperation**



Innovation fields and regional clusters in Germany selected by kompetenznetze.de

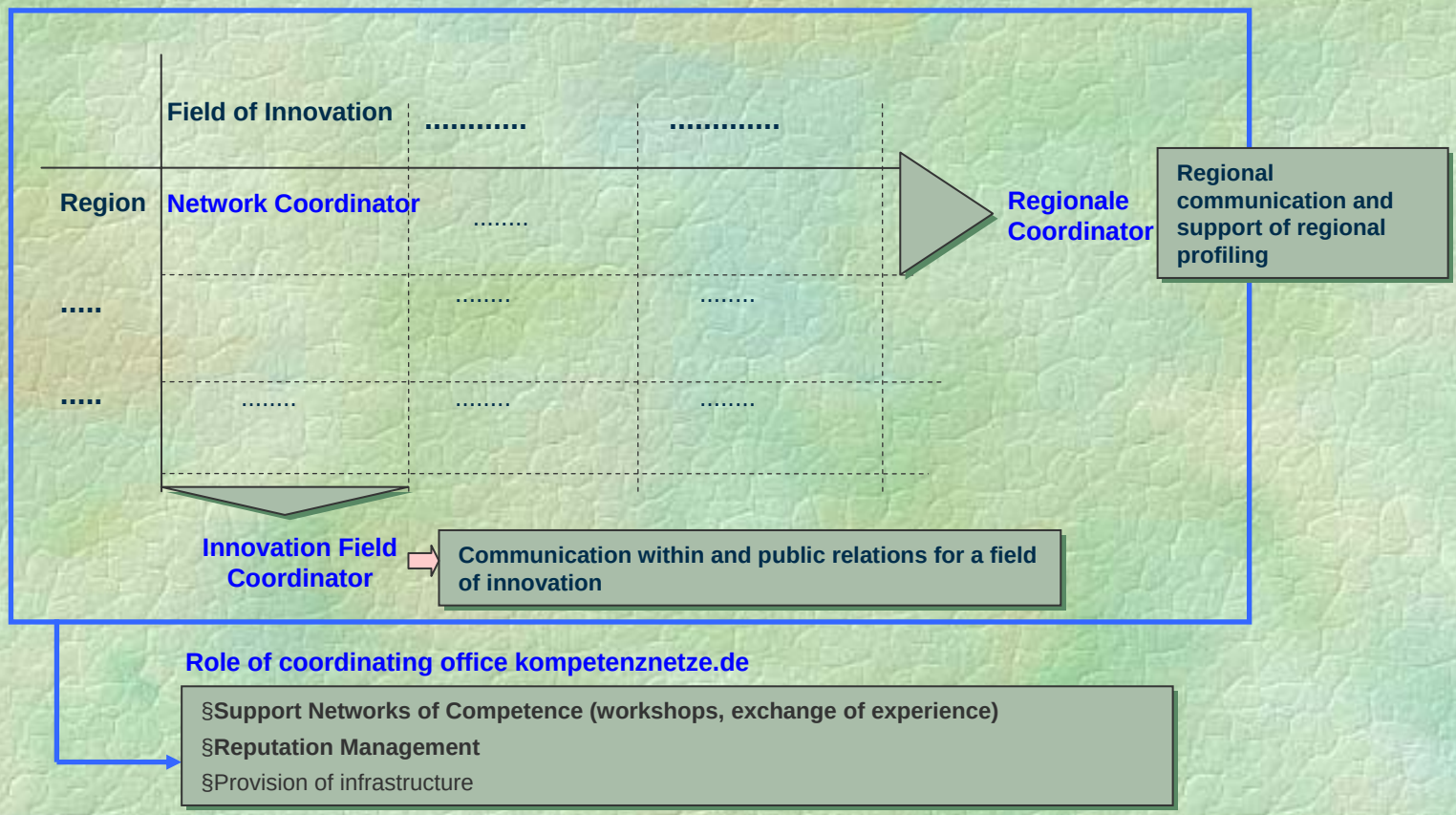
Innovationsfelder	Anzahl Netze	Regionen	Anzahl Netze
Medizin	14	Aachen	8
Biotechnologie	12	BerlinBrandenburg	8
Optische Technologien / Lasertechnik	11	Stuttgart	7
Medizintechnik	10	Ruhrgebiet	6
Materialforschung	7	Braunschweig	5
Nanotechnologie	7	Hannover	5
Industrielle Produktion	6	Erfurt - Jena	4
Transport und Verkehr	5	Nürnberg-Erlangen	4
Energietechnik	4	Karlsruhe	3
Genomforschung	4	München	3
Biomaterialien	3	Tübingen / Reutlingen / Neckar-A	3
Informationstechnologie	4	Bodensee-Oberschwaben-Ulm	2
Mikrosystemtechnik	2	Dresden-Chemnitz	2
Telekommunikation	2	Frankfurt / Rhein-Main	2
Mechatronik	2	Rheinland	2
Maritime Technologien	1	Kaiserslautern	2
Umwelttechnik	1	Hamburg	2
Luft- und Raumfahrttechnologie	1	Freiburg	1
Bildung	1	Halle-Merseburg	1
Bionik	1	K.E.R.N.	1
		OstWestfalenLippe	1
		Rhein-Neckar	1
		Weser-Ems	1
		Würzburg	1
		Darmstadt / Starkenburg	1
		Saarbrücken / Saarpfalz	1

Kompetenznetze - innovative hot spots in Germany

kompetenznetze.de informs about the best networks of competence in Germany:

- 97 networks
- 20 innovation fields
- 27 regions as local basis for network-cooperation

Organization structure tasks and responsibilities



Output of regional competence clusters

German regions with the highest patent intensity (patents/100000 employees)

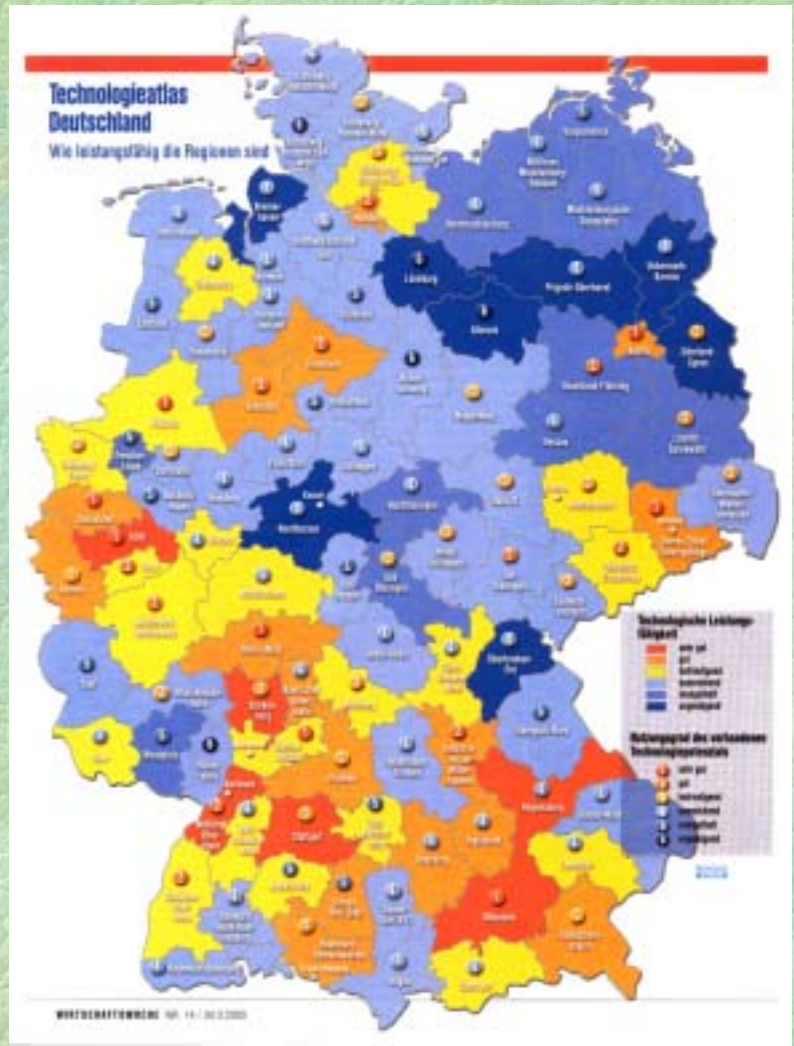
Business		Science	
Region	Patent intensity	Region	Patent intensity
Stuttgart	279.9	Aachen	27.9
Rheinpfalz	272.5	Oberes Elbtal	24.3
Ostwürttemberg	250.3	Ostthüringen	22.0
München	236.5	München	18.0
Bodensee-Oberschwaben	220.6	Mittl. Obererrhein	16.0
Main-Rhön	212.1	Mittelthüringen	12.5
Starkenburg	209.5	Braunschweig	12.2
Oberland	203.7	Oderland-Spree	11.9
Mittelfranken	199.1	Südlicher Oberrhein	11.3
Braunschweig	192.1	Unterer Neckar	10.9

Source: Deutsches Patent- und Markenamt, S.Greif, Statistik der sozialversicherungspflichtig Beschäftigten, DIW

Ranking of regional clusters

based on 12 innovation indicators

	Region	Index
1	München	59,10
2	Starkenburg	46,00
3	Regensburg	44,20
4	Mittlerer Oberrhein	42,90
5	Stuttgart	41,70
6	Köln	41,20
7	Mittelfranken	39,40
8	Düsseldorf	38,30
9	Südostoberbayern	38,10
10	Augsburg	37,10
11	Hamburg	36,80
12	Bodensee/Obersch	36,40
13	Donau/Iller	35,70
13	Hannover	35,70
15	Rhein/Main	35,50



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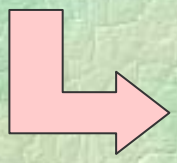
Reunification: new start for East Germany

First measures after reunification:

- **Saving the few competitive industrial capacities**
- **Integrating the best research institutions**

Current Program:

- **build up regional innovation capacities through core areas of competence**



InnoRegio Program

InnoRegio

Innovation program for the new federal states

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Optical technology networks

- funding period: 2001 - 2006
- 50 % funding by BMBF
- > 400 partners
- industry-led process
- 11 regional networks
- 1 national network of networks
- accompanying evaluation

OptechNet

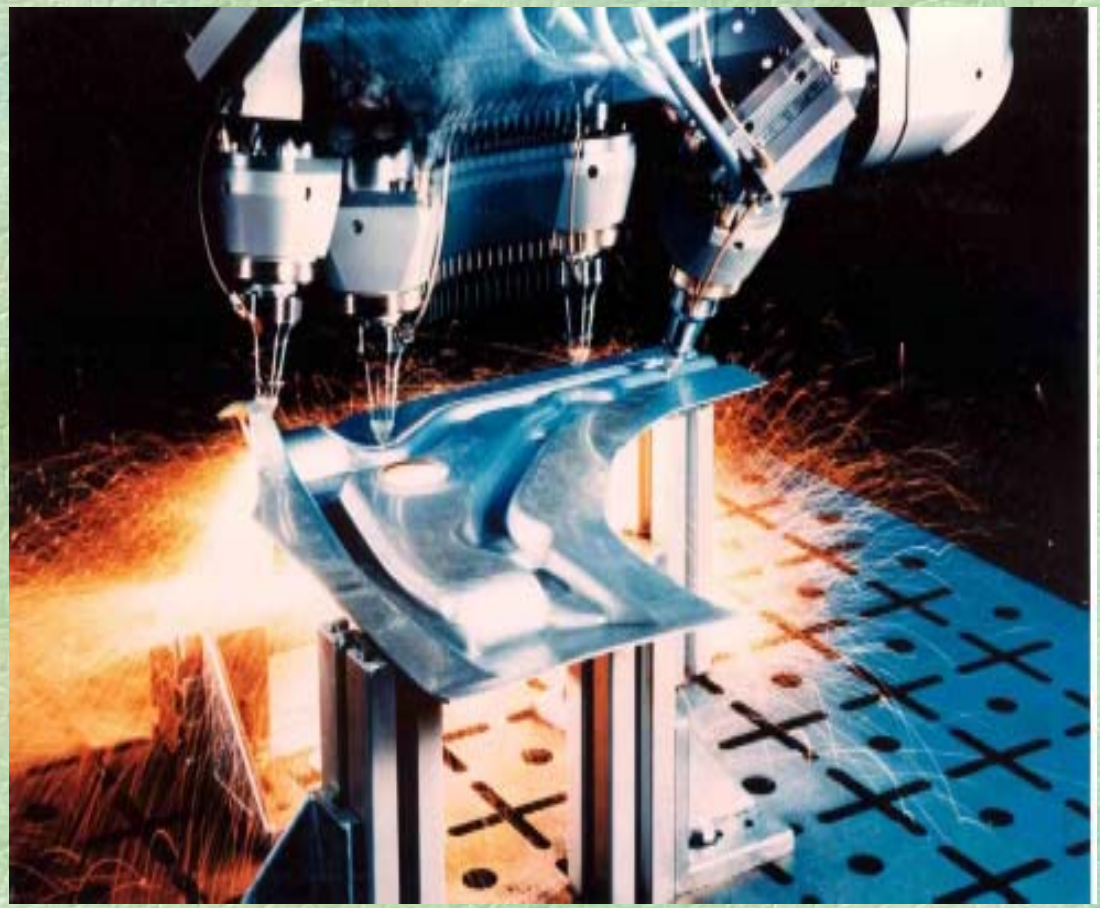
A regional cluster in the Ruhr area

Specialized in:

- displays and sensors
- optical measurement
- connection components
- optical materials

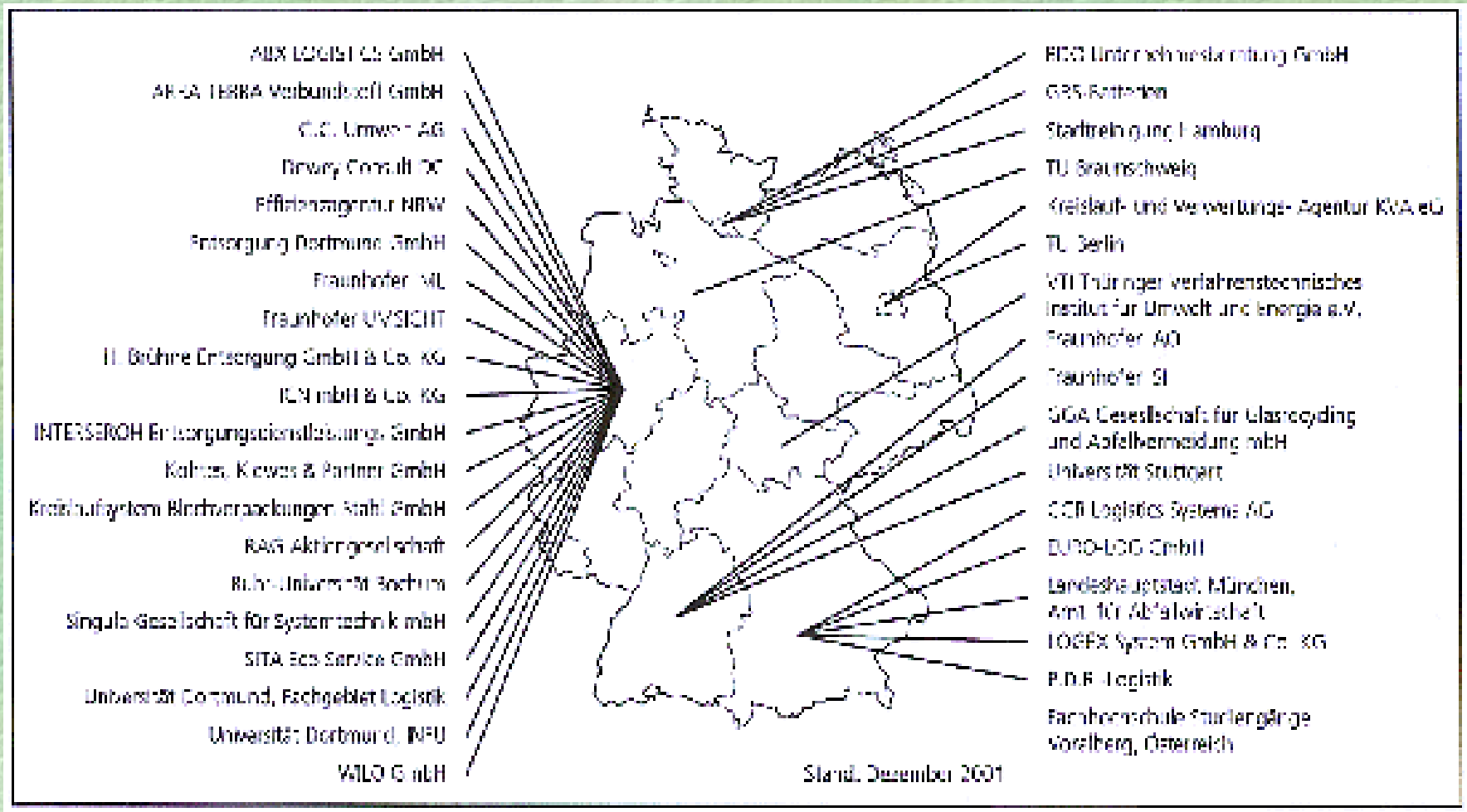
Partners:

- 25 industrial companies
- 7 research institutions
- 5 service companies



Network: Innovative Recycle Technologies

Characteristic: 1 main regional concentration and 3 subclusters



Network: Innovative Recycle Technologies

Goal: prepare the future cycle-economy with new concepts to avoid, reuse and remove garbage

Common tasks:

- 25 Research and Development Projects
- new education and professional training concepts
- common marketing and quality insurance concepts

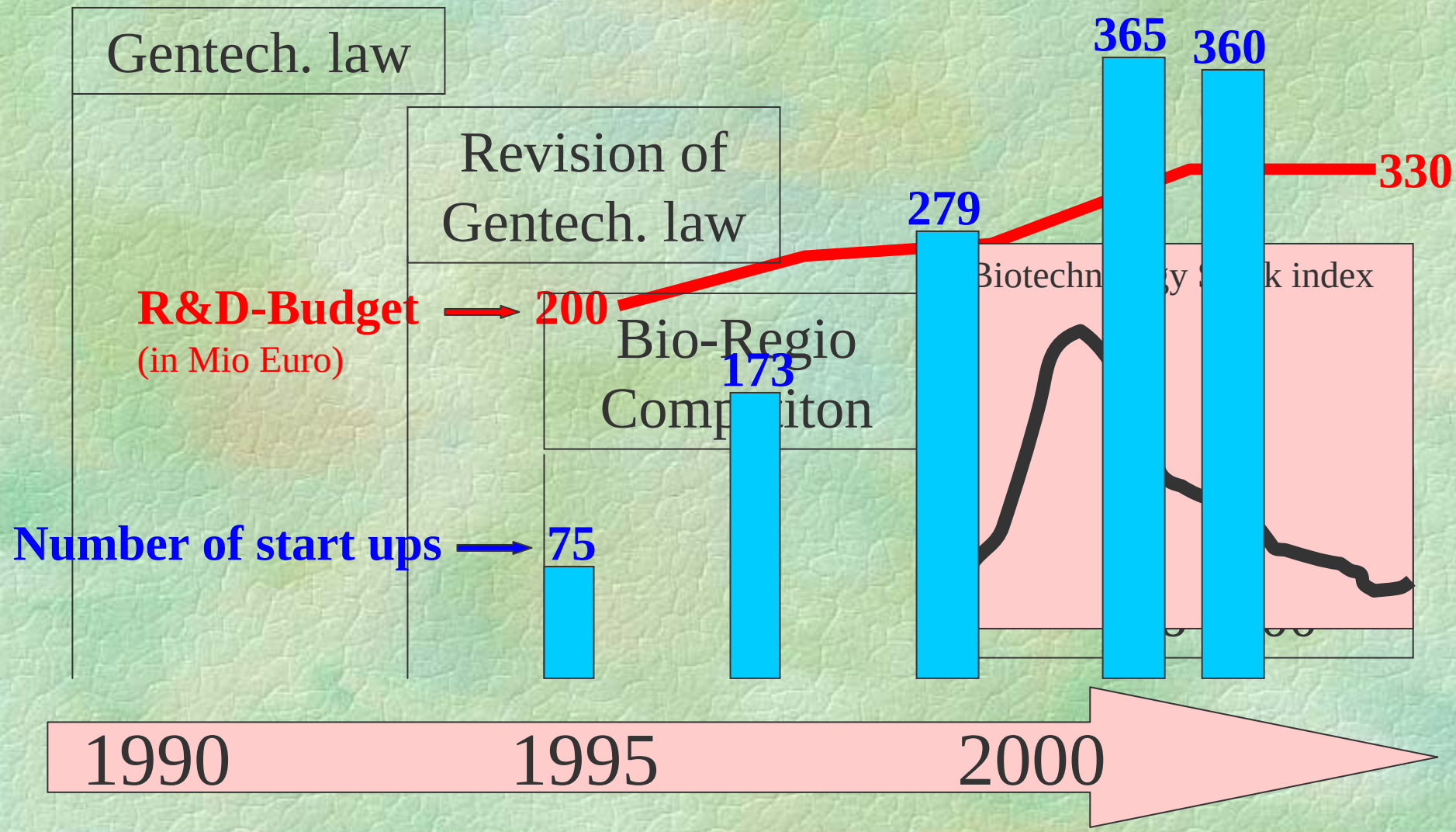
Organization: 3 Meetings per year between 21 companies, 5 consultants, 7 universities and 5 public research institutions

Effects of clustering policy to regional economy

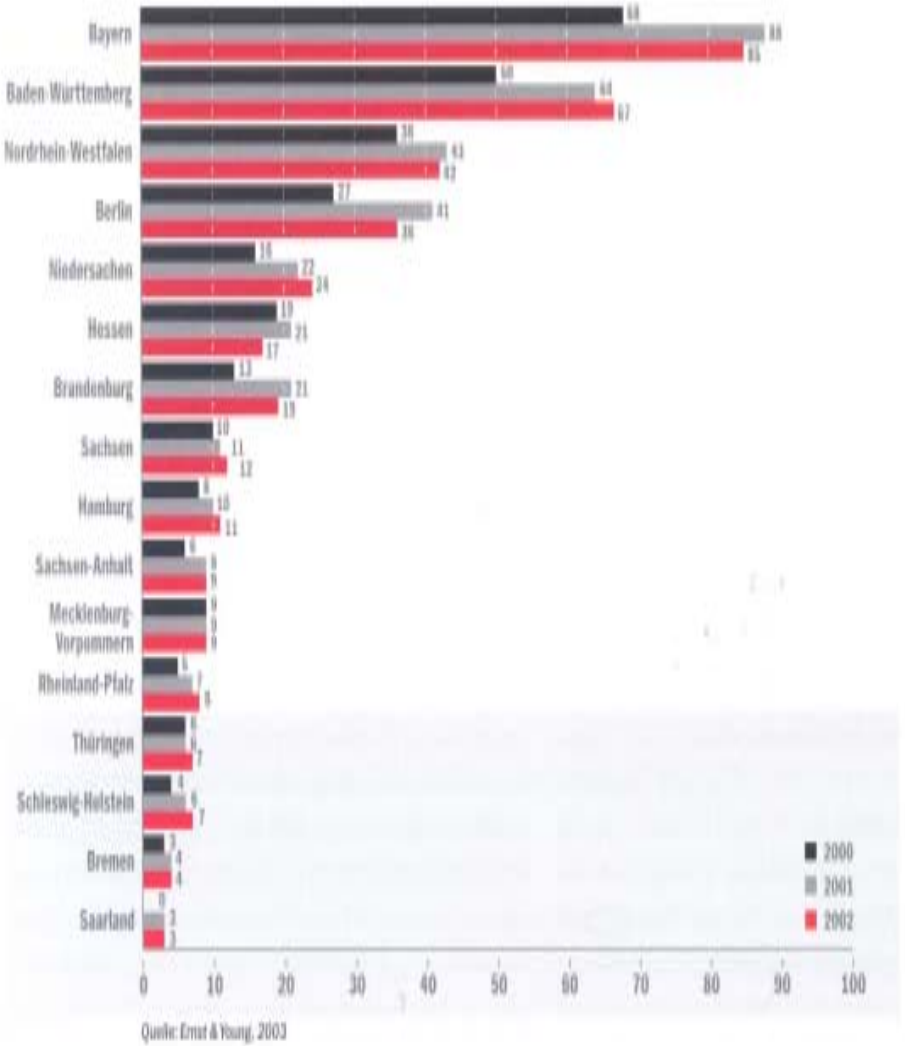
	Wolfsburg	Dortmund
Starting conditions 1998:	18% jobless rate low qualification	Jobless rate over 16% restructuring of coal and steel industry
goals:	Reduce jobless rate build up an automobile cluster	Reduce jobless rate build up clusters in IT-E-Commerce, Micro-systems, logistic
situation today:	* Jobless rate: 9,1% * 120 new start ups settlement of 100 companies	* 57 new start ups * 8 internat. companies * new private university * jobless rate: 15%

Effects of clustering to industrial competitiveness

Milestones of Biotechnology Development in Germany



Core biotech companies in Germany



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Lessons learned

Success criteria for innovation clusters

1. Conditions for high competitiveness
2. Sector-specific conditions
3. Market conditions
4. Existence of actors and networks
5. Regional frame conditions

1. Conditions for high competitiveness

- **Focussing on core competences**
- **a common business plan/innovation concept**
- **establishment of alliances**
- **international orientation**
- **strategic forecasting**
- **effective structures and responsibilities**
- **controlling and evaluation of efficiency**

2. Sector specific conditions

- **complementation of companies (e.g. value chain)**
- **accumulation of appropriate human ressources**
- **availability of innovations**
- **existence of synergies**
- **availability of risk capital**

3. Market conditions

<u>New clusters appear generally</u>

- **in growing markets**
- **in opening markets**
- **in connection of restructuring and fusion process**

4. Actors and networks

<u>Important for the cluster building are:</u>

- **a respected personality as coordinator/spokesman**
- **an efficient network/cluster management**
- **broad promotion activities**
- **active support of new companies/start-ups**

5. Regional frame conditions

<u>Favorable conditions for cluster building are:</u>

- **good education and vocational facilities**
- **an innovation friendly environment, especially for starting new companies**
- **appropriate physical infrastructure**
- **appropriate political framework (e.g. tax, regulations, subsidies, gov. purchase .....)**

What politics should observe !

- **Political support is only efficient, if the additional cost for reaching the „critical mass“ of a self sustaining cluster is low (cost benefit analysis!): the risk of investment loss is high, if the critical mass cannot be reached**
- **The concentration on one economic branch leads to high risks in case of structural economic changes**
- **Cluster policy contradicts equal distribution of economic activities. Therefore: keep equal chances through a fair competition for every region**