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
A HAR STAR	Contract (1997)	
know-how-intensive goods:		The second state
- 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:		A PARTICIA
- World Compet. Report (IMD)	10	11

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Change of R&D-policy

old

+ Focus on scientific-technological goals+ support of single institutions (institutional orientation)

Evaluation by scientific-technological criteria Promotion of good, but isolated projects



Presentation of single R&D results

new

+ Focus on innovation goals

+ support of network structures (structure orientation)

Evaluation of strategic and structural success criteria Promotion of networks, selected by competition

Active marketing of competence

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Research Promotion Policy in Germany

Networks/Clusters

Leading Projects —

Co-operation Projects

Single Projects

60th 70th 80th 90th 2000

From single projects to networks



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



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



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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	1111
Bionik	1	K.E.R.N.	1
ビー アイトレイト 大学 しい		OstWestfalenLippe	1-
		Rhein-Neckar	1
	SH 2.13 (Weser-Ems	1
		Würzburg	1
	SALAD()	Darmstadt / Starkenburg	
		Saarbrücken / Saarpfalz	1

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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 networkcooperation

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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

		5 5
Region	Index	Technologieatias Deutschland
München	59,10	Wie leistangsfähig die Regisseen sied
Starkenburg	46,00	
Regensburg	44,20	
Mittlerer Oberrhein	42,90	
Stuttgart	41,70	
Köln	41,20	
Mittelfranken	39,40	
Düsseldorf	38,30	
Südostoberbayern	38,10	
Augsburg	37,10	
Hamburg	36,80	Contraction of the second seco
Bodensee/Obersch	36,40	
Donau/Iller	35,70	
Hannover	35,70	
Rhein/Main	35,50	
	Region München Starkenburg Regensburg Mittlerer Oberrhein Stuttgart Köln Mittelfranken Düsseldorf Südostoberbayern Augsburg Hamburg Bodensee/Obersch Donau/Iller Hannover Rhein/Main	RegionIndexMünchen59,10Starkenburg46,00Regensburg44,20Mittlerer Oberrhein42,90Stuttgart41,70Köln41,20Mittelfranken39,40Düsseldorf38,30Südostoberbayern38,10Augsburg37,10Hamburg36,80Bodensee/Obersch36,40Donau/Iller35,70Hannover35,70Rhein/Main35,50

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Lessons learned

Examples/best practice

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

23 topic driven networks 8 innovative regional core growth areas **40 Research Labs** 24 interregional alliances **12 excellence centers 540 running Research Projects Program cost: 440 Mio Euro** 1999 2002 2004 2006

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Optical technology networks



funding period: 2001 - 200650 % funding by BMBF

- > 400 partners
- industry-led process
- **11** regional networks
- 1 national network of networksaccompanying evaluation



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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

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Network: Innovative Recycle Technologies

Characteristic: 1 main regional concentration and 3 subclusters



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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

367777482	Wolfsburg	Dortmund
Starting		
conditions	18% jobless rate	Jobless rate over 16%
1998:	low qualification	restructuring of coal and
er alter	State of the Alertic St	steel industry
goals:	Reduce jobless rate	Reduce jobless rate
Photo In	build up an automobile	build up clusters in IT-
	cluster	E-Commerce, Micro-
-8-2-8-19-5	chuster a set	systems, logistic
situation today:	* * Jobless rate: 9,1%	* 57 new start ups
totay.	* 120 new start ups	* 8 internat. companies
1.1182	settlement of 100	* new private university
	companies	* jobless rate: 15%

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Effects of clustering to industrial competitiveness Milestones of Biotechnology Development in Germany



Core biotech companies in Germany



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- 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

New clusters appear generally

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

4. Actors and networks

Important for the cluster building are:

- 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

Favorable conditions for cluster building are:

- 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