The Regional Innovation System (RIS) of the Country State of Bremen, Germany: Actors, Institutions, Policies, and Processes

Introductory Lecture by Professor Emeritus Dr. Karl Wohlmuth, University of Bremen, Faculty of Economics and Business Studies

Programme: Expert Seminar for the Delegation of Professors from ENIT, El Manar University Tunis and Ecole Superieure de Commerce, Campus Universitaire de la Manouba, Tunis

Monday, 18 May, 2015, 10:00 am, WIWI-Building, Hochschulring 4, Rotunde 1

The Regional Innovation System (RIS) of the Country State of Bremen, Germany: Actors, Institutions, Policies, and Processes

1. Introductory Remarks: Current Issues

2. Bremen and Germany in the International Innovation Competition

3. National and Regional Innovation Systems: Strategies for Germany and for Bremen

4. Bremen: The Role of the Regional Innovation System in a Small Country State

5. Perspectives and Final Remarks

The Regional Innovation System (RIS) of the Country State of Bremen, Germany: Actors, Institutions, Policies, and Processes
Introductory Remarks

1. Bremen has developed a Regional Innovation System since the 1970s when the University of Bremen was opened, although the Universities of Applied Sciences have a long tradition in Bremen.

2. Most important was the push of a technology policy since 1985, caused by structural changes, like the shipbuilding sector crisis (AG Weser started in 1872 with 1400 ships built and collapsed in 1983, obviously because of one-sided product policies); so we see 30 years of experience with STI policies in Bremen.

The Regional Innovation System (RIS) of the Country State of Bremen, Germany: Actors, Institutions, Policies, and Processes
Introductory Remarks

3. Bremen has an international reputation in economic sectors such as aviation and space industries, automotive industries, international logistics; but also other sectors such as food and beverages, tourism, finance, environment- and health-related enterprises play a role. Most exposed to international competition.

4. But a RIS has also to care for the small and medium enterprises (SMEs), especially in crafts, trade, and in services (like IT, consulting, advisory, personal, caring and catering services, etc.), and in the non-profit field.

The Regional Innovation System (RIS) of the Country State of Bremen, Germany: Actors, Institutions, Policies, and Processes
Introductory Remarks

5. There is now a hot debate how to reach the SMEs and also the micro-enterprises (one-person and family enterprises). Bremen is starting to experiment with microfinance instruments, especially in Gröpelingen (Bremen town) and in Bremerhaven-Lehe (Bremerhaven town). This is due to high unemployment and poverty rates in some parts of the two towns.

6. To get funds from the European Union (EU) for these disadvantaged areas in Bremen smart, sustainable and inclusive (SSI) growth strategies have to be identified.

The Regional Innovation System (RIS) of the Country State of Bremen, Germany: Actors, Institutions, Policies, and Processes
Introductory Remarks

7. Phase 1 (1985-2005) of building coherent STI Policies and a functioning RIS in Bremen: Building infrastructure, technology parks, expanding the research focus of the universities and related research institutes, moving from social sciences to production engineering, logistics and natural sciences; development of innovation funding mechanisms.

8. Phase 2 (2005-2015): Increasing role of networking, building associations, high-profile projects and programmes, and institutional consolidation (WFB).

Bremen

HOME OF INNOVATION

Universität Bremen

The Regional Innovation System (RIS) of the Country State of Bremen
Bremen and Germany in the International Innovation Competition

The enterprise sector in the Country State of Bremen is largely influenced by the National Technology Policies and Innovation Strategies and by the National Innovation System of the Federal Republic of Germany.

The other major partner is the European Union (EU) with their far-reaching science, technology and innovation (STI) policies and strategies; huge funding.

But also the regional technology policies and innovation strategies of Bremen impact on the firms.

The Regional Innovation System (RIS) of the Country State of Bremen
Bremen and Germany in the International Innovation Competition

At the federation level, the High-Tech Strategy 2020 "Ideas. Innovation. Prosperity." (developed since 2006 and decided in 2010) is of relevance:

Focuses: **Global Challenges; Forward-looking Projects; Key Technologies; Cross-Cutting Issues; Dialogue on Innovations; Steps towards a European High-Tech Policy; etc.**

Five key policy areas: **Climate and Energy; Health and Nutrition; Mobility; Security; and Communication**

The Regional Innovation System (RIS) of the Country State of Bremen
Bremen and Europe in the International Innovation Competition

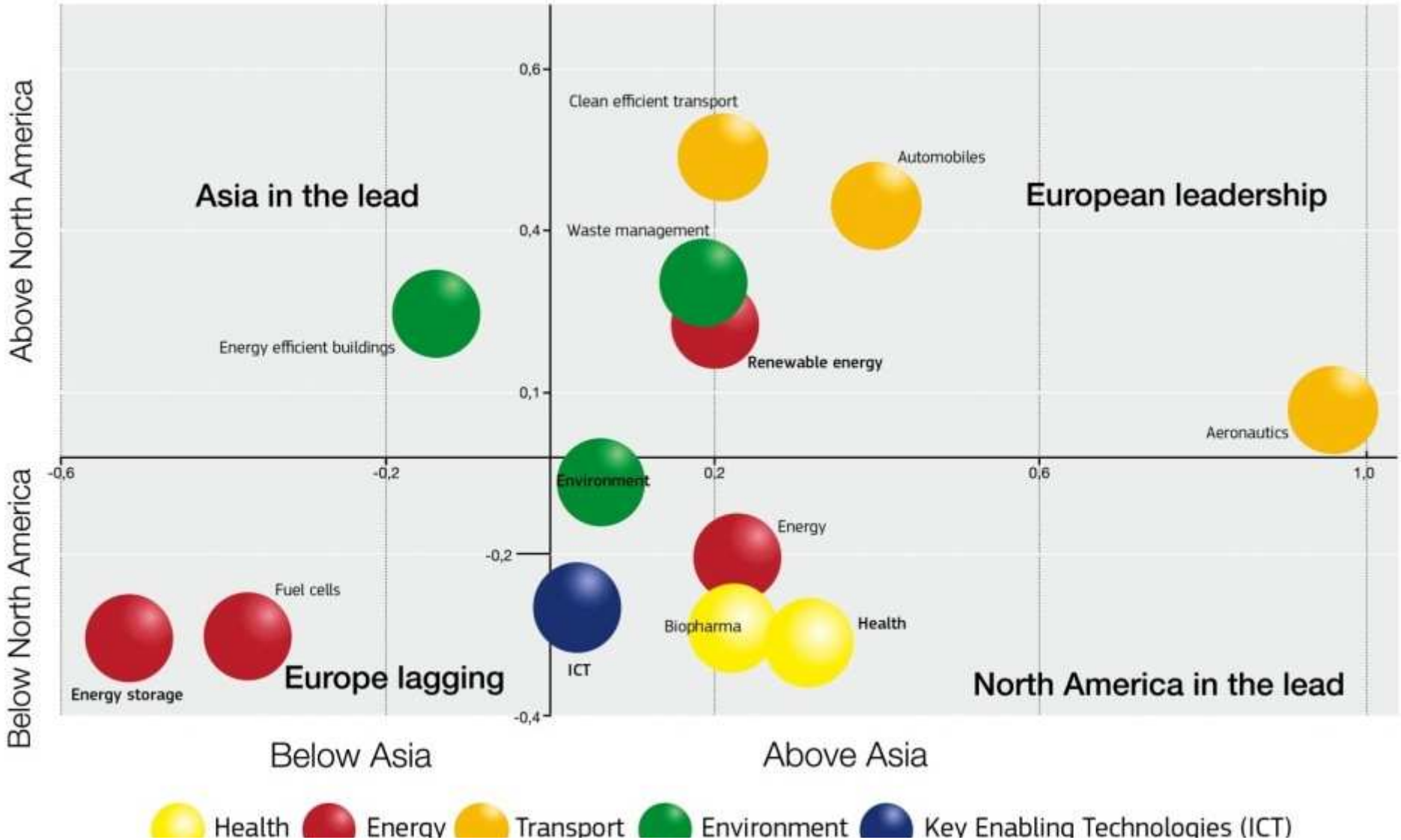
Europe is on the way to become an "Innovation Union", which is a Europe 2020 initiative; the bi-annual *"Innovation Union Competitiveness"* report (IUC 2013) highlights the achievements, challenges and problems. It is published every two years and covers all the 28 EU Member States and six countries which are associated to the EU research framework programme. The report contributes to the *"Europe 2020 Strategy"* for jobs and growth, by providing an in-depth statistical and economic analysis of STI performance.

The Regional Innovation System (RIS) of the Country State of Bremen
Bremen and Europe in the International Innovation Competition

“Horizon 2020” is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020), and in addition it aims to attract private investment. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.

“Horizon 2020” is the major financial instrument for implementing the Innovation Union, a Europe 2020 flagship initiative, aimed at securing Europe's global competitiveness. Bremen benefits from this initiative.

The Regional Innovation System (RIS) of the Country State of Bremen and Europe (IUC 2013)



The Regional Innovation System (RIS) of the Country State of Bremen
Germany and Bremen in the Global Innovation Competition

The Federal Republic of Germany is - according to the *Innovation Union Scoreboard 2014* of the EU (IUS 2014) - an "innovation leader" (position 3, former year's position in IUS 2013 was 2), beside of Sweden (position 1), Denmark (position 2) and Finland (position 4).

The other 24 EU-Countries (including now Croatia) are „innovation followers", „moderate innovators" und „modest innovators". There is a huge and increasing hierarchy in the EU (similar to the regions in Germany).

The Regional Innovation System (RIS) of the Country State of Bremen
Germany and Bremen in the Global Innovation Competition

The EU has a lead in innovation performance relative to Australia and Canada and an even larger lead relative to the BRICS countries; however the most important exception is China as this country gradually reduces its performance gap - by improving its performance faster and at a higher rate. EU has to look at China!

However, the lead of South Korea, USA, and Japan over the EU is due to indicators capturing business activity, such as R&D expenditures in the business sector. EU has to look at South Korea, as it is increasing its lead!

The Regional Innovation System (RIS) of the Country State of Bremen
Germany and Bremen in the Global Innovation Competition

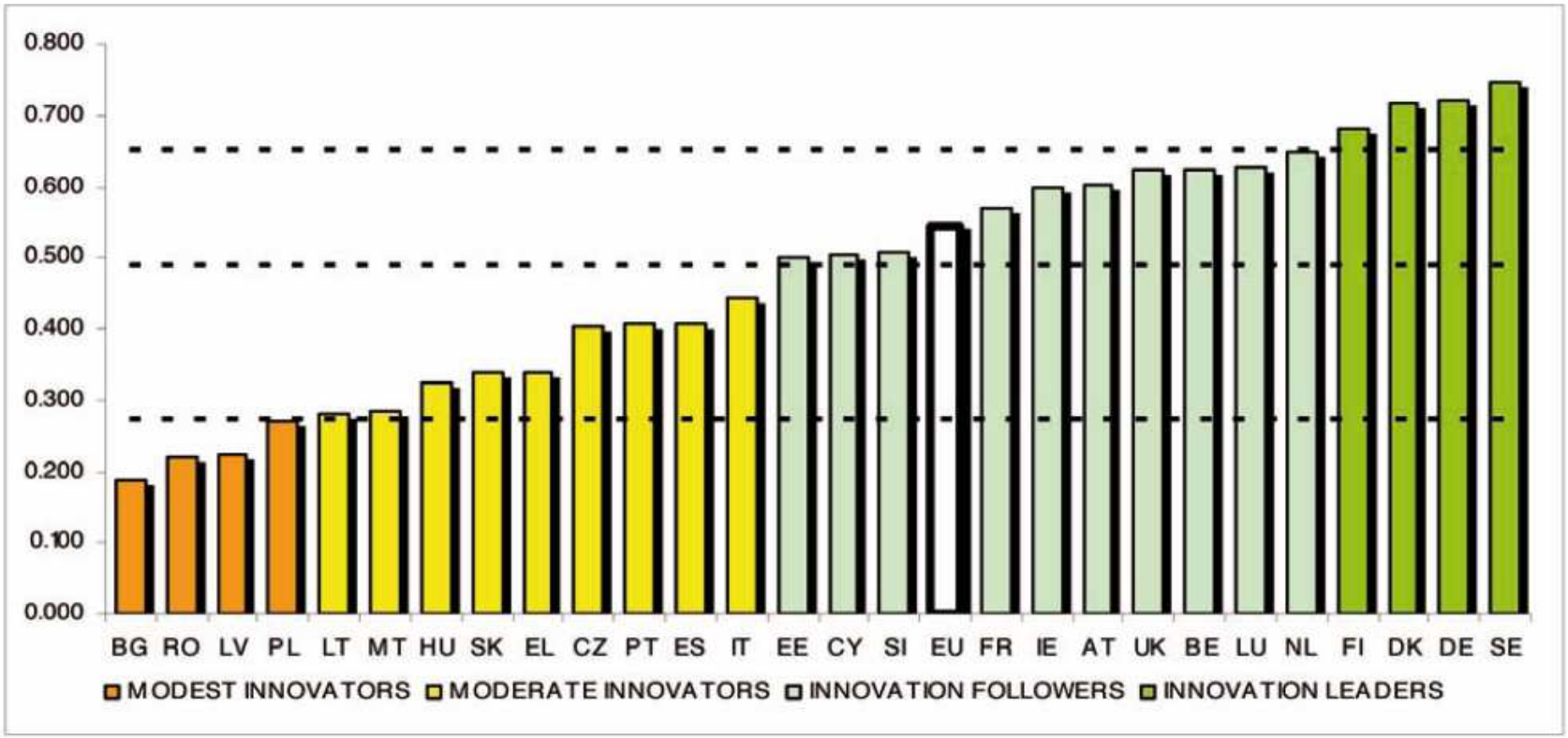
The Innovation Union Scoreboard (IUS) considers, first, *Enablers* (Driving Forces of Innovation Performance, such as the qualification of the personnel, the quality of the research systems, and the financing of R&D). Second, considered are *Firm Activities* (Entrepreneurial Measures, such as R&D Investments, R&D Linkages, and Intellectual Property). Third, considered are *Outputs* (Impacts of the enterprises, such as the Type of Innovation and the Economy-wide Effects such as on Qualified Employment, on the Trade Balance, etc.).

The Regional Innovation System (RIS) of the Country State of Bremen
Germany and Bremen in the Global Innovation Competition

Germany and other innovation leaders are getting stronger, while the disparities in Europe are on the increase. Germany, and to a much smaller extent also Bremen, benefit from the linkages of SMEs with R&D institutions, the high R&D expenditures of enterprises, the high patent intensity, the quality of the tertiary education sector, and the strength of linkages between research and industry. Bremen lags in these areas!

Germany is still benefitting from the balanced research, education, training, and innovation systems.

Figure 2: EU Member States' innovation performance



Note: Average performance is measured using a composite indicator building on data for 24 indicators going from a lowest possible performance of 0 to a maximum possible performance of 1. Average performance reflects performance in 2010/2011 due to a lag in data availability.

The performance of Innovation leaders is 20% or more above that of the EU27; of Innovation followers it is less than 20% above but more than 10% below that of the EU27; of Moderate innovators it is less than 10% below but more than 50% below that of the EU27; and for Modest innovators it is below 50% that of the EU27.

Figure 2: EU Member States' innovation performance

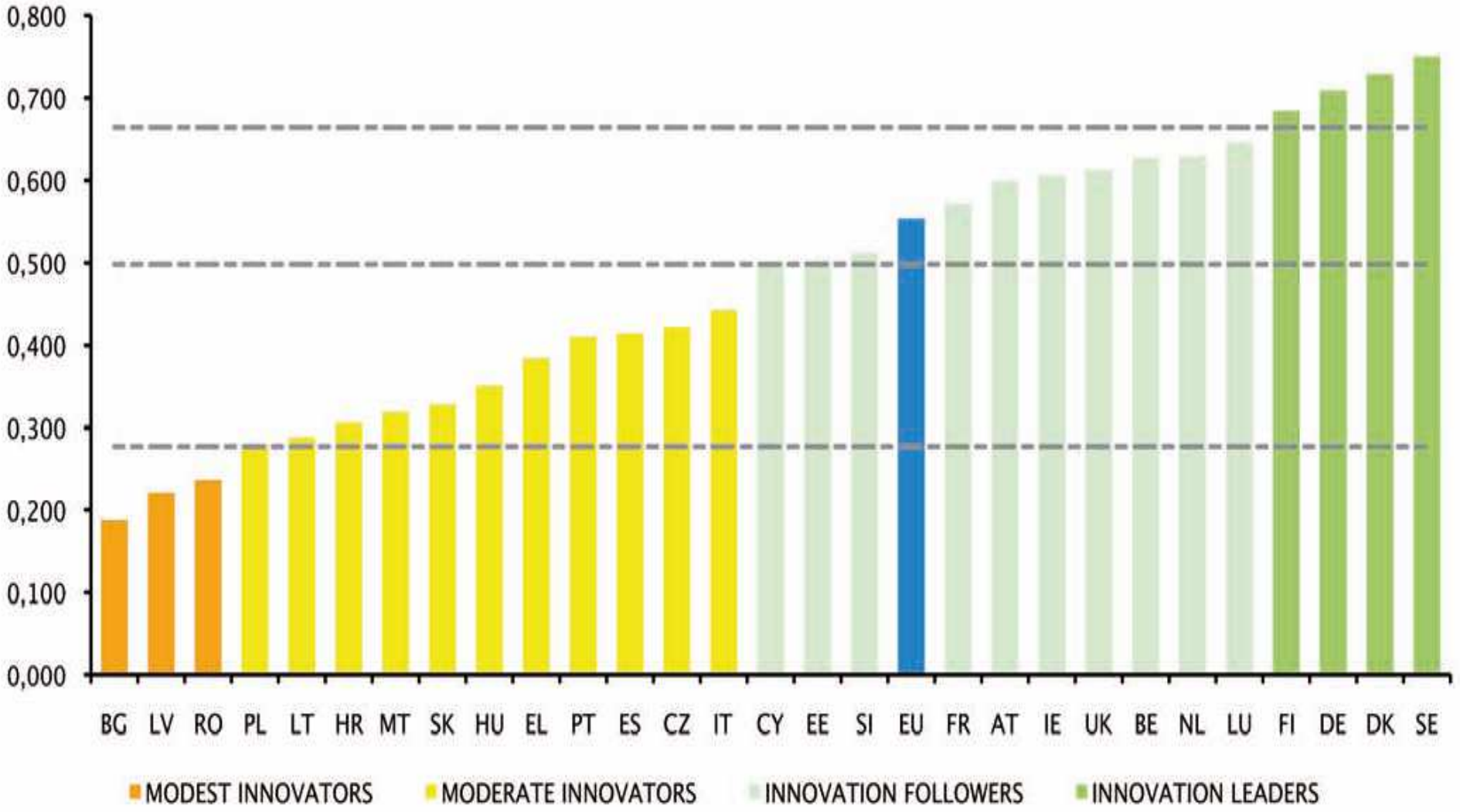


Figure 19: EU27-China comparison

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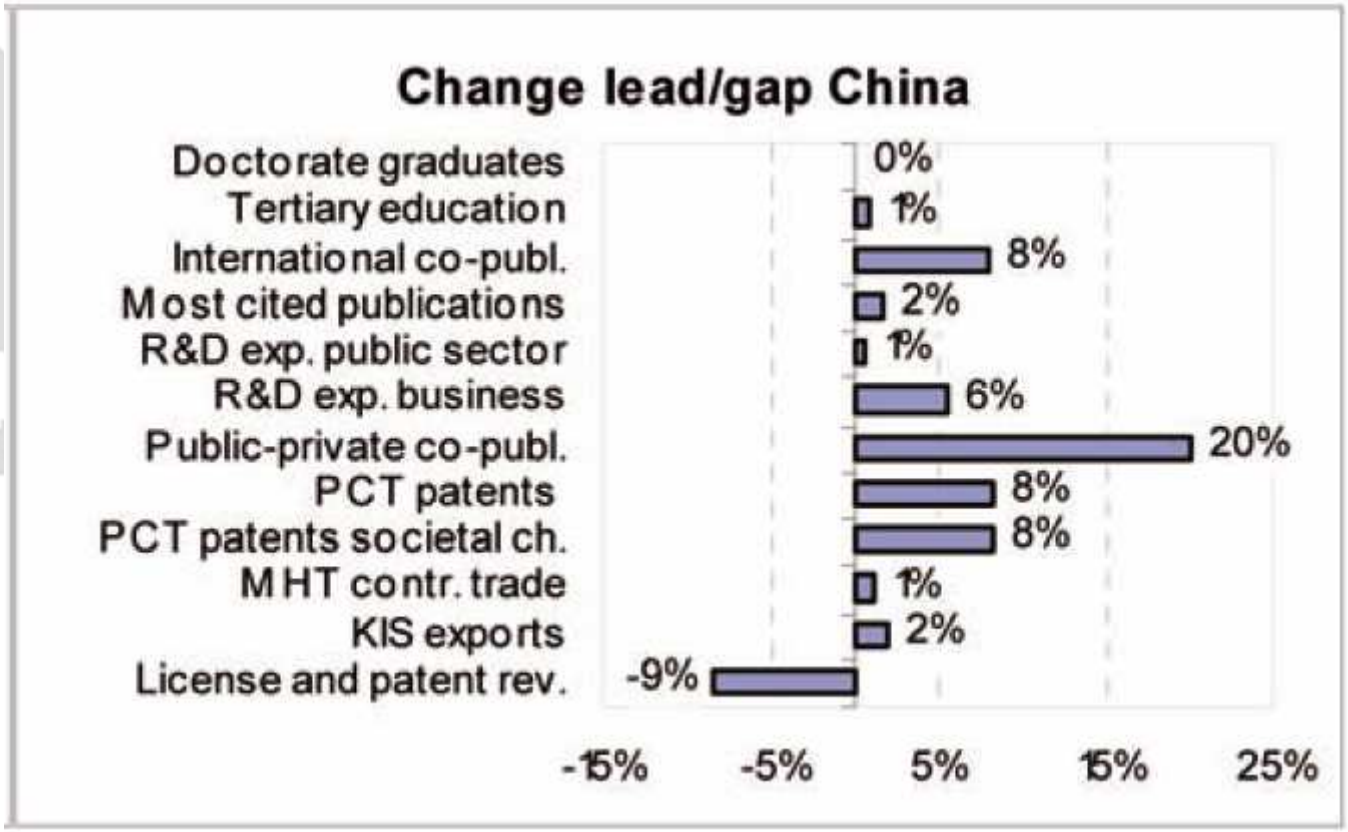
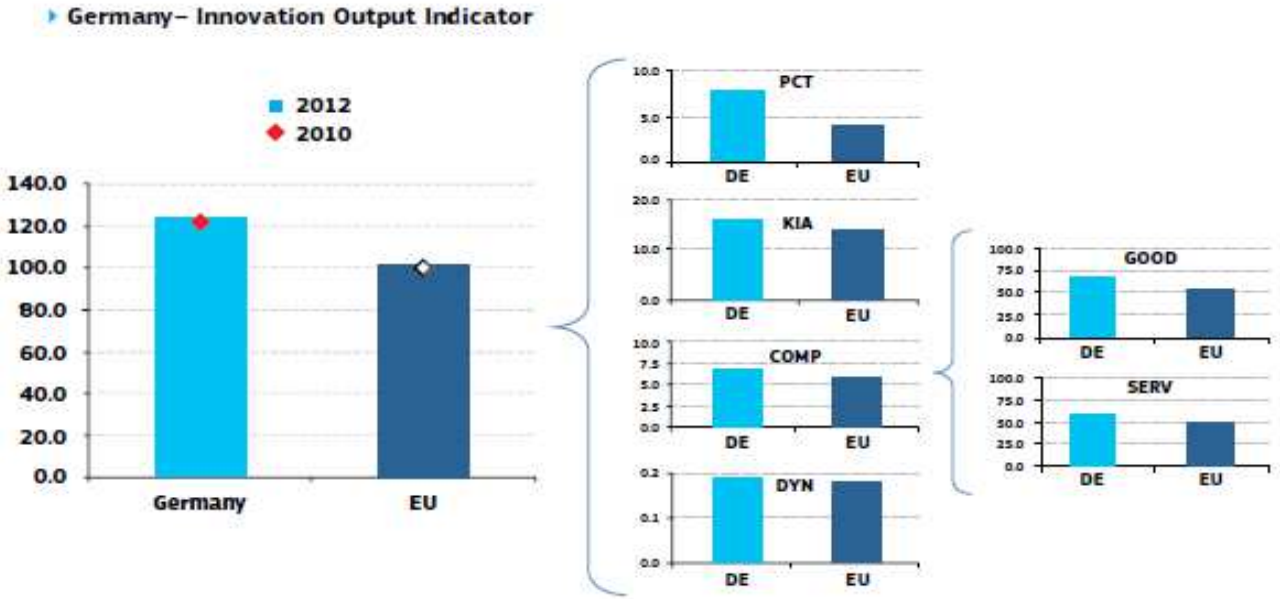


National and Regional Innovation Systems: Strategies for Germany and for Bremen
Research and Innovation Performance EU 2014

Key indicators of research and innovation performance	
R&D intensity 2012: 2.98 % (EU: 2.07 %; US: 2.79 %) 2007-2012: +3.3 % (EU: 2.4 %; US: 1.2 %)	*Excellence in S&T*[1] 2012: 59.0 (EU: 47.8; US: 58.1) 2007-2012: +2.2 % (EU: +2.9 %; US: -0.2)
Innovation Output Indicator 2012: 124.2 (EU: 101.6)	*Knowledge-intensity of the economy*[2] 2012: 47.1 (EU: 51.2; US: 59.9) 2007-2012: +1.0 % (EU: +1.0 %; US: +0.5 %)
Areas of marked S&T specialisations: Automobiles, environment, energy, and key production technologies	*HT + MT contribution to the trade balance* 2012: 9.2 % (EU: 4.23 %; US: 1.02 %) 2007-2012: +1.7 % (EU: +4.8 %; US: -32.3 %)

National and Regional Innovation Systems: Research and Innovation Performance EU 2014



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat, OECD, Innovation Union Scoreboard 2014, DG JRC
Notes: All data refer to 2012 except PCT data, which refer to 2010.
PCT = Number of PCT patent applications per billion GDP, PPS.
KIA = Employment in knowledge-intensive activities in business industries as % of total employment.
DYN = Innovativeness of high-growth enterprises (employment-weighted average).
COMP = Combination of sub-components GOOD and SERV, using equal weights.
GOOD = High-tech and medium-high-tech products exports as % total exports. EU value refers to EU-28 average (extra-EU = 59.7 %).
SERV = Knowledge-intensive services exports as % of total service exports. EU value refers to EU-28 average (extra-EU = 56 %).

National and Regional Innovation Systems: Strategies for Germany and for Bremen

The „High-Tech Strategy 2020“ of Germany intends to secure global competitiveness and the transition to a knowledge society based on sustainable development. Five key focus areas are mentioned: climate and energy; health and nutrition; mobility; communication; and security. These five key areas will lead to future- and mission-oriented projects, based on innovation and technology forecasting. A close cooperation of industry and research is intended, based on a Competition of Clusters and a Research Union.

National and Regional Innovation Systems: Strategies for Germany and for Bremen

In “future-oriented projects” all the challenges play a role which are mentioned in the global megatrends: One example is the “CO2 emission-neutral, energy-efficient and climate change-adapted” town, and this theme will be filled with projects. “Securing a self-determined life in old age” is another example, focussing on support systems. “Sustainable Mobility” is a third example, being related to electric mobility. Other examples could be mentioned. These are based on networks between politics, science and economy.

National and Regional Innovation Systems: Strategies for Germany and for Bremen

R&D support for Small and Medium companies (SMEs; in Germany called "Mittelstand") plays a great role in Germany. The *Central Innovation Programme for the "Mittelstand"| Zentrales Innovationsprogramm Mittelstand (ZIM)* is a major instrument. This type of support is most important in Germany and it is part of the German entrepreneurial success story. ZIM promotes market-oriented technological R&D projects.

Selection criteria refer to the possibilities to introduce the R&D solutions profitably into the market.

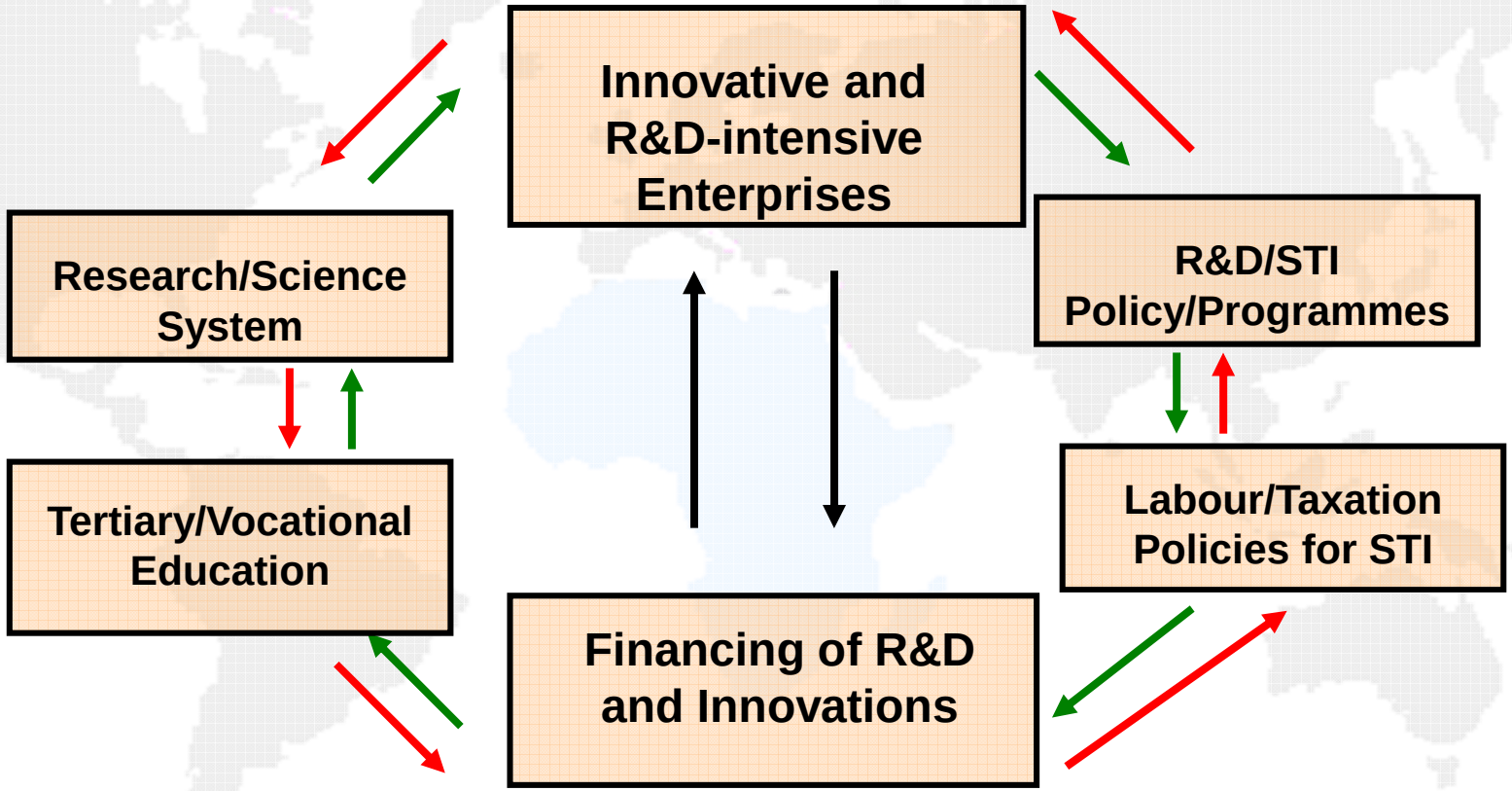
National and Regional Innovation Systems: Strategies for Germany and for Bremen

ZIM-KOOP promotes cooperative ventures between enterprises, while ZIM-SOLO promotes individual projects of single enterprises.

All these programmes are relevant also for the "Mittelstand" in Bremen, but participation depends on strictly adhering to the criteria for the allocation of funds. Bremen can do more and better in this respect!

Important is the incorporation of all these programmes into the National/Regional/Local Innovation Systems.

The National Innovation System as a Network of Actors and Institutions



National and Regional Innovation Systems: Networks, Functions and Properties

The National Innovation System/ the Regional Innovation System (NIS/RIS):

- ***determines*** **the rate, the quality and the type of innovative activities in an economy (guidance/orientation function);**
- ***reveals*** **the direction and intensity of technology and information flows and the impacts of economic incentives to interact strongly in the system (information/incentive function);**

National and Regional Innovation Systems: Networks, Functions and Properties

The National Innovation System/ the Regional Innovation System (NIS/RIS):

- ***displays*** **the linkages between institutions and actors and as well the cooperation deficits in the national/regional innovation system (signalling function);**
- ***shows*** **the entry points for public and private sector interventions to improve the system (political and private sector intervention function).**

National and Regional Innovation Systems: Networks, Functions and Properties

The National/Regional Innovation System (NIS/RIS):

- **should be *balanced* between actors and institutions (balancing the pillars of the system);**
- **should be *open* for cross-country information and technology flows and transactions (all the pillars should be open);**
- **should be *adapted dynamically* according to new global and regional STI and Mega trends (all the pillars should be updated dynamically).**

National and Regional Innovation Systems: A Hierarchy of Innovation Systems

It is important to understand that the *National Innovation System (NIS)* of Germany is embedded/integrated into an evolving *"European Innovation System" (EIS)* which is determined by large-scale European Science, Technology and Innovation Strategies. The NIS of Germany is also part of an evolving *"Global Innovation System" (GIS)* which is characterised by integrated research, development and innovation systems of global corporations and by international intellectual property conventions (WIPO).

National and Regional Innovation Systems: Networks, Functions and Properties

Also, *Sub-Regional European Innovation Systems (SREISs)* play a role as there are many regions with strong STI cross-border interactions (Alsace in France-South West Germany). At the national level *Sectoral Innovation Systems/SISs* (such as automotive, aviation and space, food and beverages, pharmacy, health) and *Sub-Regional Innovation Systems (SRISs)* play a role (such as the *"Metropolregion Bremen-Oldenburg of North Western Germany"*).

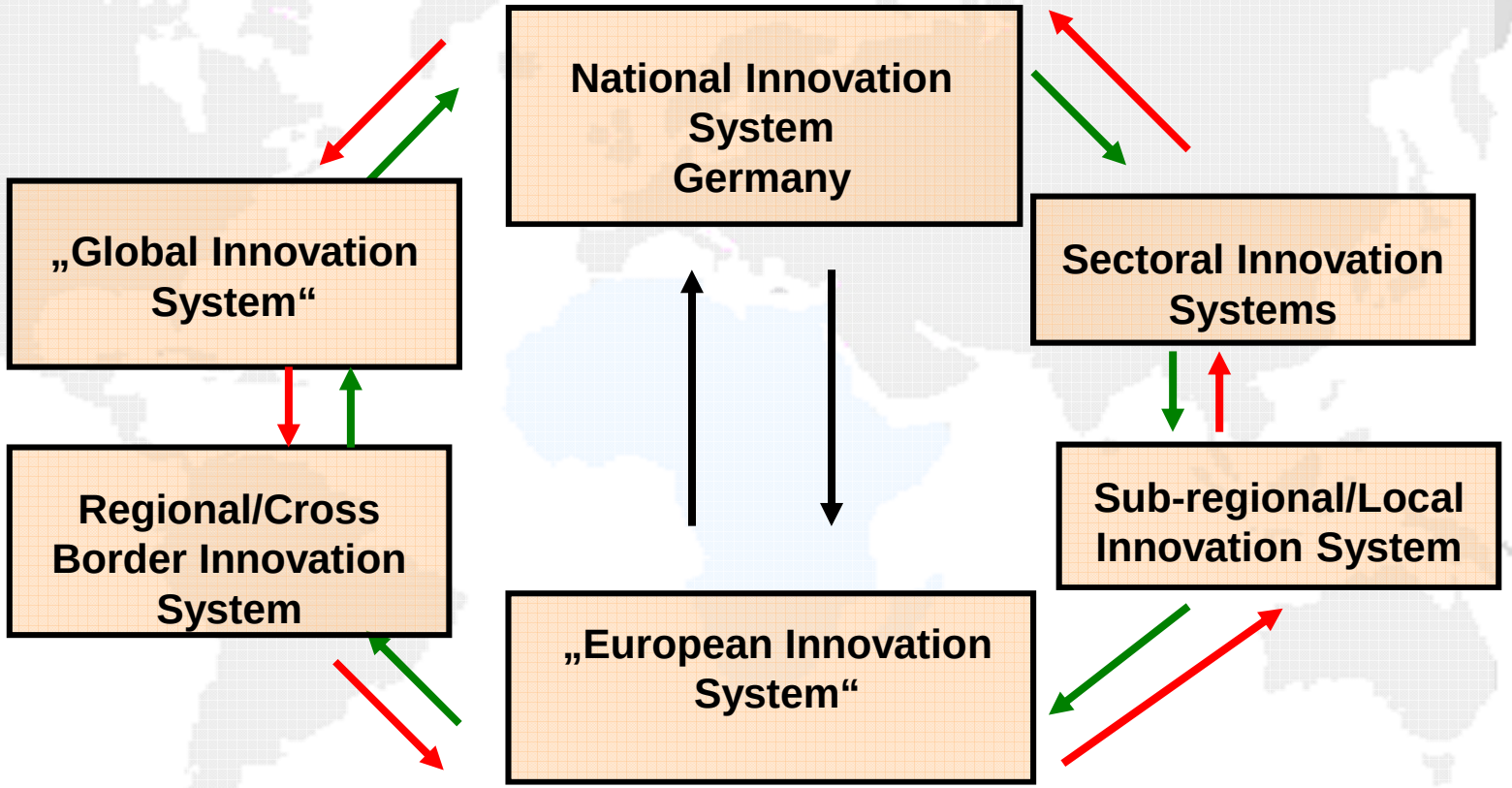
This means that openness between levels is important.

Bremen: The Role of the Regional Innovation System in a Small Country State

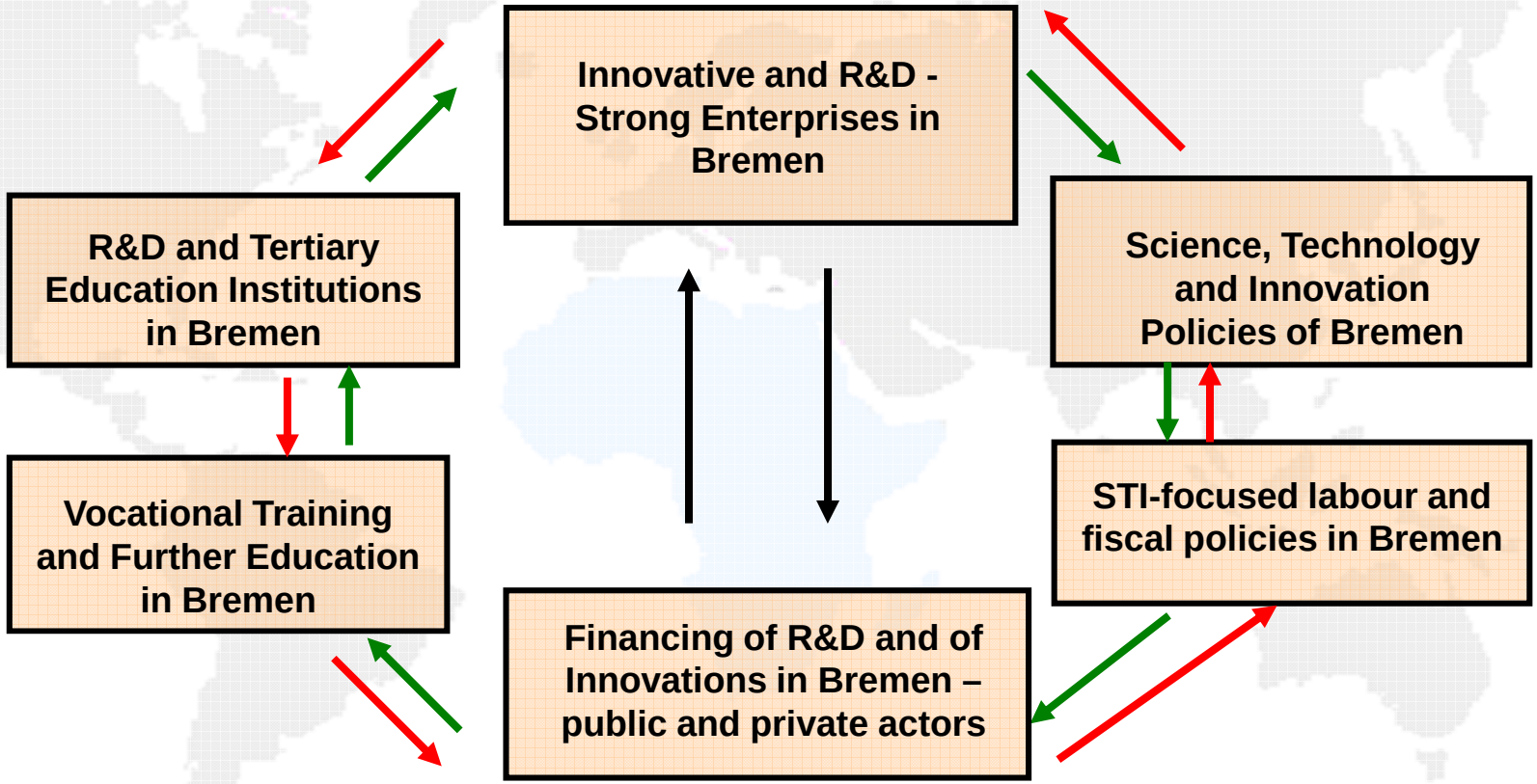
But also *Local Innovation Systems (LISs)* such as for the town of Bremen and for the town of Bremerhaven have to be looked at. We can see that between Bremen Town and Bremerhaven Town economic structures differ, fiscal revenues differ, also political processes differ, so that local innovation systems have to be adapted to the local circumstances.

Important are the linkages between the pillars at the specific level and the interactions between all these levels. Bremen is an interesting case of interaction.

Bremen: The Role of the Regional Innovation System (RIS) in a Small Country State



Bremen: The Role of the Regional Innovation System (RIS) in a Small Country State



Bremen: The Role of the Regional Innovation System in a Small Country State
The Innovation Strategy and Policy

The *Innovation Programme 2020/Innovationsprogramm 2020 of Bremen supports the Structural Strategy/ Strukturkonzept 2015* of Bremen and the *Master Plan Industry/Masterplan Industrie* of Bremen. The policy objectives for the three innovation clusters (aviation and space industries; wind power industry; and maritime industries/logistics) are a) to strengthen the specific value chains by integrating more effectively at the local space the lead enterprises, the suppliers, the service companies and the R&D institutions;

Bremen: The Role of the Regional Innovation System in a Small Country State
The Innovation Strategy and Policy

b) to reach a national lead position and a global visibility of the industry; and c) to develop a coherent and effective promotion policy for the three innovation clusters towards the creation of sustainable linkages between industry and science.

Although these three innovation clusters are defined rather broadly, covering various segments of industry and R&D institutions, recent discussions reveal that overemphasizing these three clusters may not be appropriate for Bremen's industry development.

Bremen: The Role of the Regional Innovation System in a Small Country State
The Innovation Strategy and Policy

The *Innovation Programme 2020* also emphasizes eight Kompetenzfelder/"Competence Areas" with a high innovation potential and a promising outlook for the future: *automotive sector*; *environment-related industries*; *health-related industries and life sciences*; *food and beverages industry*; *creative sector activities*; *ICT sector*; *machinery industry with robotics*; and the *innovative materials sector*.

In these eight areas the linkages between enterprises and science institutions should become strengthened.

Bremen: The Role of the Regional Innovation System in a Small Country State
The Innovation Strategy and Policy

The linkages may become strengthened by strategic industry-science alliances, so as to make the *"strengths of Bremen even stronger". "Strengthening the strengths"* - by focussing in Bremen on available key technologies, traditional economic sectors and future-oriented growth potentials – is a major theme now in policy discussions. In order to generate additional employment, new strengths are needed in all these competence areas. Recent evidence shows that knowledge transfer from science to industry is weak.

Bremen: The Role of the Regional Innovation System in a Small Country State
STI-related Labour and Fiscal Policies

Securing employment and extending the employment potentials in the three clusters and in the eight competence areas **is of central importance for a sustainable and successful policy to restructure the economy of Bremen.** ***The intention is to strengthen the innovative companies and to create qualified jobs in innovative and high-growth enterprises.*** **Thereby the public revenues should become increased by generating higher local taxes.** ***However, the results of this policy are rather poor so that changes are needed.***

Bremen: The Role of the Regional Innovation System in a Small Country State
STI-related Labour and Fiscal Policies

Complementary to this overall economic policy is the *Employment Policy Action Programme for Bremen and Bremerhaven/labelled as: "Beschäftigungspolitisches Aktionsprogramm für Bremen und Bremerhaven"*, financed by Bremen and the EU. Three areas are promoted: a) measures to improve the functioning of the labour market so that structural change is speeded up; b) improving the individual chances to get a job; and c) fighting against long-term unemployment. *Also this programme needs drastic and continual reforms.*

Bremen: The Role of the Regional Innovation System in a Small Country State
The Research and Tertiary Education System

The five universities in Bremen and Bremerhaven are linked with technology, science and innovation parks and are located in different parts of the country state. The linkages with the three clusters and the eight competence areas are of different quality and strength. Bremen has also a Science Plan 2020/Wissenschaftsplan 2010 (of July 2014).

Five very broad areas are mentioned: 1) Marine Sciences (including environmental sciences); 2) Materials Sciences (including aerospace);

Bremen: The Role of the Regional Innovation System in a Small Country State
The Research and Tertiary Education System

3) Information and Communication Sciences (including Logistics and Robotics); 4) Social Sciences; and 5) Health Sciences. The relation to the three clusters and the eight competence areas according to the Innovation Programme 2020 of Bremen is rather weak. There is more conformity with the High Tech Strategy 2020 of the Federal Republic of Germany.

Attached to the universities are Related Research Institutes, so-called "An-Institute", like BIBA, ISL, MARUM, being part of the local public research system.

Bremen: The Role of the Regional Innovation System in a Small Country State
The Research and Tertiary Education System

Attached are also research institutes with private sector and public federal funding, belonging to large associations like Fraunhofer, Max-Planck, DFKI, DLR, IWT/AWT, etc. Overall, there is a strong and diversified scientific landscape in Bremen, but there seems to be a duplication of efforts in terms of inputs for research at the five universities (and one university is private, but needs also public support). Monitoring is rather weak!

A major weakness is the link with business (in terms of patents, innovative companies, and new export fields).

Bremen: The Role of the Regional Innovation System in a Small Country State
The Research and Tertiary Education System

University of Bremen/Universität Bremen: **This university was awarded in 2012 the status of an Excellent University by the German Scientific Community. It is located in the centre of the *Technology Park Bremen/Technologiepark Bremen*, which is existing since 25 years. Many research institutes, funded by local, private, federal and EU sources, are based here. Important companies, like Siemens, BEGO und OHB, are located here (overall 500 firms); some of them are doing research in Bremen.**

Bremen: The Role of the Regional Innovation System in a Small Country State
The Research and Tertiary Education System

Jacobs University: **This private international university is located in Bremen-North (Grohn) and has three research focus areas:**

MOBILITY (of people, goods, and information);

HEALTH (focus on bioactive substances); and

DIVERSITY (in modern societies).

It is planned to have strong links with a newly built Science Park in the area. Private universities have in Germany not a great tradition, but progress is seen.

Bremen: The Role of the Regional Innovation System in a Small Country State
The Research and Tertiary Education System

University of Applied Sciences Bremen/Hochschule Bremen: **This university is located in Bremen-Neustadt (Bremen New Town). The University has four locations. The aerospace engineering studies branch is located in the Airport City; so the School is near the Airbus research and production facilities. Also the „GZA Gründerzentrum Airport“/”Business Incubator Centre Airport” is located there. An International Graduate Center receives visitors from China and other countries for further education.**

Bremen: The Role of the Regional Innovation System in a Small Country State
The Research and Tertiary Education System

Hochschule Bremerhaven/University of Applied Sciences Bremerhaven: **This university has a maritime profile and has research clusters in the fields of energy and marine/offshore technologies, information and communication technologies and automation, life sciences, logistics and services. Also a Fraunhofer Anwenderzentrum für Windenergie-Feldmessungen (AWF)/Fraunhofer Application Centre for Wind Power Energy Measurements is located at the campus, as well as other research institutes for wind power energy. .**

Bremen: The Role of the Regional Innovation System in a Small Country State
The Research and Tertiary Education System

Hochschule für Künste Bremen/University of Arts: **This university has two locations. The Faculty of Music is in the Old Town of Bremen, wile the Faculty of Arts & Design is in the harbour area called Überseestadt Bremen. It is intended to make this university to become a centre of the creative activities in Bremen.**

According to recent studies the various segments of the creative industries can have an important escalator effect on the overall innovative activity in Bremen and enhance the innovative capacity of Bremen.

Bremen: The Role of the Regional Innovation System in a Small Country State
Vocational Education and Further Education

The *Chamber of Commerce of Bremen* and the *Chamber of Industry and Commerce of Bremerhaven/Handelskammer Bremen* and *Industrie- und Handelskammer Bremerhaven* are responsible for the vocational formal training of around 200 or more occupations in industry, trade and services, and crafts. New occupations which are emerging in the digital age require that tertiary education and the research system interact with vocational training. Improvements are needed in this respect in Bremen and in Bremerhaven.

Bremen: The Role of the Regional Innovation System in a Small Country State
Vocational Education and Further Education

New vocational training schemes for new occupations have to be developed in time in order to increase the innovative capacity. The "dual vocational training system" of Germany has to be developed further. Networking with universities and research institutes is important, but weaknesses are there. Awareness has to be created at the levels of researchers, teachers and labour market institutions. Bremen has also a country programme *"Qualified Staff Initiative"/„Bremer Fachkräfteinitiative" so as* to promote specific areas.

Bremen: The Role of the Regional Innovation System in a Small Country State
Innovative and R&D-intensive enterprises in Bremen

Around 2.5% of the GDP of Bremen is spent on R&D, and the share of the enterprises is 0.9%. Out of around 27,000 entities (firms) only 900 are near the R&D frontier (in areas of medium, high and leading edge technologies, in knowledge-intensive industries and other sectors), what is a share of only 3%. Around 6,000 persons have occupations in the R&D fields. For an innovative economy to expand, also the small trade, IT, services, and crafts firms have to be supported by STI institutions in order to generate qualified jobs.

Bremen: The Role of the Regional Innovation System in a Small Country State
Innovative and R&D-intensive enterprises in Bremen

Out of these 6,000 jobs these are shared equally by government, universities and business. The number of open job positions in R&D areas is reported as relatively high. Around 70,000 out of 280,000 employees are working in medium/high technology industries. This is a share of around 25%, and regrettably this share has not increased despite of (costly, but obviously ineffective) innovation policies. The number of patents is small (150 per year), but the real number may be at 300 (150 counted outside).

Bremen: The Role of the Regional Innovation System in a Small Country State
Financing R&D and Innovations in Bremen

***Industrielle Gemeinschaftsforschung (IGF)/Collective Industrial Research Programme*, organized by AiF as a research network by industry. This programme is supported by the Federal Ministry of Economy and Energy and is also used by enterprises and research institutes in Bremen. By pre-competitive and enterprise-transcending projects the competitiveness of medium-sized enterprises should be secured. This programme is important for Bremen in fields such as logistics, control systems, innovative materials, etc.**

Bremen: The Role of the Regional Innovation System in a Small Country State
Financing R&D and Innovations in Bremen

Three programmes of the country state of Bremen (FEI, PFAU und AUF): **These programmes intend to support small and medium enterprises on an individual basis. FEI (Programm zur Förderung von Forschung, Entwicklung und Innovation) is a programme to promote Research, Development and Innovation by the Senator of Economy, Labour and Harbours. PFAU (Programm zur Förderung Anwendungsnaher Umwelttechniken) is a programme by the Senator for Environment, Construction and Traffic to support the**

Bremen: The Role of the Regional Innovation System in a Small Country State
Financing R&D and Innovations in Bremen

application of environment technologies. AUF (Förderprogramm Angewandte Umweltforschung) is a programme by the Senator for Environment, Construction and Traffic to support applied environment research. AUF supports networks of industry and science, while PFAU supports production integrated environmental protection. FEI is administered by economic promotion agencies of Bremen (WFB) and of Bremerhaven (Bremerhavener Gesellschaft für Investitionsförderung und Stadtentw.)

Bremen: The Role of the Regional Innovation System in a Small Country State
Financing R&D and Innovations in Bremen

EU-wide acquisition of cooperation partners and innovation projects: **Via the Enterprise Europe Network (EEN) a Europe-wide acquisition of partners and projects in the fields of internationalization, technology transfer and research cooperation is facilitated. Bringing together enterprises with complementary capabilities and similar business interests is an important aspect to benefit from European market integration. EEN gives advice concerning EU's R&D programmes and Cooperation Facilitation programmes.**

Bremen: The Role of the Regional Innovation System in a Small Country State
Financing R&D and Innovations in Bremen

Financing Technology Transfer Offices: **Various technology transfer institutions are financed with public funds, in order to promote small and medium-sized firms, also in the crafts sector. Some examples: UniTransfer, ttz Bremerhaven, Innovation and Technology Consultants for the Crafts Sector/Beauftragte für Innovation und Technologie (BIT) im Handwerk. The Institute for Water Engineering/Institut für Wasserbau (IWA) of the University of Applied Sciences is another example.**

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ttz Bremerhaven, enterprises in Bremerhaven and the University of Applied Sciences Bremerhaven cooperate in the fields of food, environment and health (Research for a Higher Quality of Life).

However, the record of technology transfers from tertiary education and research institutes in Bremen is rather mixed. According to recent studies the transfer to small and medium-sized companies is not functioning effectively. Bridging agents and intermediaries are not effective (high cost, low output).

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The Bremen Bank for Start-Up Financing (BAB/Bremen Aufbau-Bank) has some funding windows, also for microenterprises in economically and socially weak town areas, but the impact is still limited.

Also the private sector is weak in financing start-ups of innovative firms and of innovations of established firms. Neither the innovation financing of the banks nor of the venture capital funds is adequate. New forms of venture capital financing like crowd funding are not practised widely. All this is a great task for the future.

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The Model of Technology Transfers of Bremen

The Model of Technology Transfers of Bremen – Building Networks of Institutions and Companies: **At the level of public and self-governing institutions (WFB, BAB, RKW, Chambers of Commerce and Crafts) a network for innovation in Bremen - „brinno.net“ - was institutionalized, to bring together five important actors for the benefit of enterprises: Wirtschaftsförderung Bremen/WFB, Handelskammer, Handwerkskammer, Rationalisierungskuratorium der deutschen Wirtschaft/RKW Bremen, Bremer Aufbau-Bank/BAB.**

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By such ventures also strategic and long-term support is provided to the enterprises, also in the frame of so-called “innovation labs” (workshops, studios). In Bremerhaven the local economic development agency, Bremerhavener Gesellschaft für Investitionsförderung und Stadtentwicklung (BIS), is active in these fields.

Via WFB and BIS there is also access for small and medium enterprises to federal programmes, such as “innovation vouchers” in the go-innovativ-Programme.

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By such innovation vouchers external consulting services are financed up to 50% of total cost for enterprises with less than 50 employees, so as to introduce product and process innovations.

Bremen has an equivalent country state programme to support R&D and Innovation for small and medium-sized firms in the context of the FEI (Forschung, Entwicklung, Innovation) programme. Payment is for consulting services, *„Innovationsberatungsdienste und innovationsunterstützende Dienstleistungen“* (IDL).

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Executive agencies are WFB in Bremen and BIS in Bremerhaven. BIS supports also specific qualification measures which stimulate innovations.

All these programmes are bureaucratic in terms of application so that the impact and the relevance are limited. An evaluation of these instruments is not easy. Nevertheless these innovation vouchers and innovation labs are recommended in new studies for Bremen (RWI study 2015), but also again and again in STI policies for developing and transition economies.

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At the enterprise level, networks are promoted in Bremen for the three clusters and for the eight competence areas:

Cluster Aviation: **The network „Aviabelt Bremen“ is in place so as to create a network between enterprises and science, at the level of decision-makers and at the level of experts, also to have a voice in relation to politics at local and federal levels. Aviabelt Bremen e.V. and Hanse-Aerospace e.V. in Hamburg recently have joined forces. Impact on competition, markets, returns?**

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Cluster Space Technologies: **Building networks at Global and European levels, such as for the Galileo programme (Sat Nav-Forum, NEREUS). NEREUS is a Network of European Regions Using Space Technologies; it is an initiative by regions from all over Europe, which share as full members its governance.**

Cluster Maritime Logistics: **The network "Maritime Security Bremen"/„Maritime Sicherheit Bremen"/MARISSA is embedded into the federal cluster "Security Industry"/"Sicherheitswirtschaft".**

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Cluster Wind Power Energy: **The Wind Power Energy Agency Bremen/Bremerhaven/Windenergie-Agentur Bremerhaven/Bremen e.V. (wab) coordinates the interests of 270 enterprises and institutes; Bremerhaven has a lead role in developing wind power energy technologies. Bremen and Bremerhaven are also part of an initiative for the region of North-West Germany/„Nordwestinitiative“ (Metropolregion Bremen-Oldenburg). Via the company and brand „germanwind“ innovative projects are initiated and coordinated.**

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Also for all the competence areas we find such networks, covering not only Bremen, but partly also the North-West Region. It is not clear how open and how effective the networks are. Examples are given below:

Competence Area Automotive Industries/Electrical Mobility/Kompetenzfeld Automobilwirtschaft/ Elektromobilität: **There is a network „Automotive Nordwest“; Bremen has a competence centre for the C-Class Cars of Daimler; and there is also a „Personal Mobility Center NordWest“ for electrical mobility.**

Perspectives and Final Remarks

The regional innovation system of the country state of Bremen is deeply embedded into the innovation systems of the North-West region, the national innovation system of Germany, cross-border regional innovation systems, and the European innovation system. All the pillars of the regional innovation system are in place. But improvements are needed with regard of all pillars and with regard of all the links between the pillars. The problems are seen more clearly now!

A lot has to be done in Bremen in the coming years.