The RIGHT Project

Regional Report on the Energy (Blue) Sector

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Introduction

This document has 4 Parts and Appendices provide additional instructions and information as needed. Contact information of the lead researchers are also found in the Appendices.

Part 1 is the Regional Innovation Ecosystems (RIE) mapping that will provide a qualitative understanding of the region's innovation ecosystem with regards to its Smart Specialization Strategies (S3) or an equivalent regional strategy. This part is divided into a socio-economic and R&D profile mapping and a SWOT analysis. The RIE is an adaptation of a methodology and tool used by The eDigiregion Project. In the RIGHT Project, the benchmarking tools are used for mapping the own regional ecosystems and later through this common tool to compare the findings of the different partners in the project. Part 1 is to be filled in by experts from policy from the region. Staff from the economic departments and, or innovation policy are possible candidates for the initial mapping. The conclusions of Part 1 will then be written up in the Conclusions Part of the Regional Report (see last paragraph on Part 4 of this document).

Part 2 is intended to map the innovation capacity and needs of SMEs from the chosen sector. The questions are adapted from a systemic study on cluster developments, Future of Cluster Developments, in which an analysis model was developed (Manickam, 2018). Part 2 involves face-to-face interviews with 6-8 SMEs from the sector. The outputs of these interviews are to be summarized into one template. Common themes and issues can be extracted from the interviews and included in the Conclusions Part of the report. Partners are requested to send the complied overview of all answers from the SMEs (translated to English) and sent to the research team (mail addresses in the Appendices).

Part 3 is the Job Forecasting and Skills Gaps mapping using the JOES templates provided in the Appendices. Each region is asked to choose 2 iconic SMEs, one from the 'old' and one from the 'new' type of business in the chosen sector. Specific instructions have been included in the Appendices of this document. The findings of the JOES are to be sent to the research team as indicated in the Appendices.

Part 4 is the Conclusions section. Highlights of each of the 3 analyses are to be described in this part of the report as described. The Conclusions of the analyses should be discussed in the light of regional strategies (S3) and policies in order to identify possible future directions for the sector and possibly the region as a whole. General questions have been posed to identify issues that could be included. To support and strengthen work in this part of the analysis, a panel of experts from policy, industry and academia is strongly recommended.

Part 1

Regional Innovation Ecosystems (RIE)

Part A: Socio-economic and R&D Profile

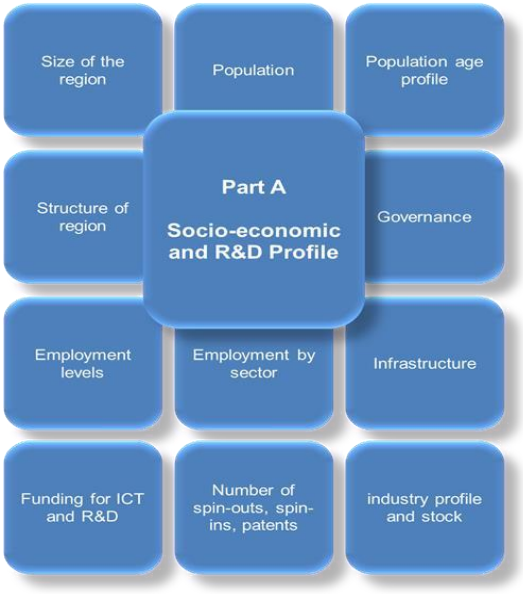

Illustration: eDigiregion Project Team (2017)

The Regional Innovation Ecosystems is an adaptation of the eDigiregion Project Team's 'Regional Innovation Benchmarking Audit' developed to support realization of the Digital Agenda in an FP7 project. The lead researcher (Bill o' Gorman) and the Spanish team provided materials and permission to build on their work. The RIGHT Project research team thanks them for their generosity and support. Details on the project to be found at www.edigiregion.eu

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Region's Socio-economic and R&D Profile

General information of region

Geographic location of region: Federal Republic of Germany

Population: 1.8 Mio _____ Area of region: Metropolitan Area of Hamburg

Governance of region:

Germany is a federal state, with 16 states. Hamburg is, next to Berlin and Bremen, a city-state, city and state at the same time.

Hamburg is governed by the regional parliament (Bürgerschaft) as legislative body (Legislative) and the Senate as administrative body (Executive). Seven Districts are a mixture of an independent city and an administration-unit, they have limited rights with an own parliament and a leader of the administration acting as a mayor, but no own taxes.

Hamburg and different surrounding counties (Landkreise) are building the Metropolregion Hamburg, a more or less virtual unit without an own budget and own parliaments.

Next to Hamburg the other states of Northern Germany (Lower Saxony, Schleswig-Holstein, Bremen and Mecklenburg-Western Pomerania) are having their own economic policy. In some cases they are cooperating, but not in all. For example they established an umbrella-body with the objective to coordinate the maritime-cluster-agencies.

Structure of region
(For example, number of sub-regions/counties, number of large urban areas, whether the region is predominantly urban/rural, industrial/agricultural/public sector oriented)

Like all federal states, Hamburg has its own parliament with legislative powers. Specialist authorities comparable to the ministries work at the level of the entire city.
There are also seven districts, each with a parliament and an administration. Similiar to a city, the districts are mainly responsible for municipal issues.

In order to promote coordinated regional development, the "Hamburg Metropolitan Region" was founded with the surrounding districts in the federal states of Schleswig-Holstein and Lower Saxony. This is a committee for exchange and non-binding cooperation. The metropolitan region does not have the legal competence, an elected parliament or council or an independent budget.

Infrastructure profile

	Size/type/quantity	Comment
Broadband	4G	The standard 4G is implemented at the core of the region. The rural peripheral parts of the region are struggling with not so good conditions.
Other ICT infrastructure		
Seaports	1 43 km of quays, 9000 ships/year, ca. 55 terminals, 8.7 MTEU, shipyards for maintenance and repair	Hamburg is round 100 km away from the North Sea. Actually Hamburg is loosing market-chares, compared to Antwerp and Rotterdam. Deeping the river Elbe is a challenge, conserving the nature is a real problem, next to storing the excavated good. Other seaports within a 2hr range for trucks by highway (Bremerhaven, Bremen, Brake, Cuxhaven, Stade, Brunsbüttel, Lübeck, Kiel, Wismar)
Airports	1	Hamburg has one public airport – and a private airport runned by AIRBUS, the airplanes producing company, this airport is (at the moment …) only for AIRBUS-purposes. Three other regional airports at Bremen, Schwerin and Luebeck are 100 km away from

		Hamburg. Hanover is 120 km away.
Roads Motorways	Different (A1, A7, A23, A39)	Crossing the river Elbe is still a challenge, mainly on weekends, because of the increasing traffic
Roads Secondary		
Public transport - railways	There are three railway-systems: - Regular trains, important for daily commuters, travelling a longer distance (more than 15 kilometers) - S-Bahn (metro) for longer distance up to 15 kilometers - U-Bahn (subway), riding mainly underground	
Public transport – bus	With 110 bus-lines, the HOCHBAHN, biggest public bus-company at Hamburg offers much mobility. More than 800 vehicles are driving on more than 920 kilometers with more than 1.300 bus-stops.	

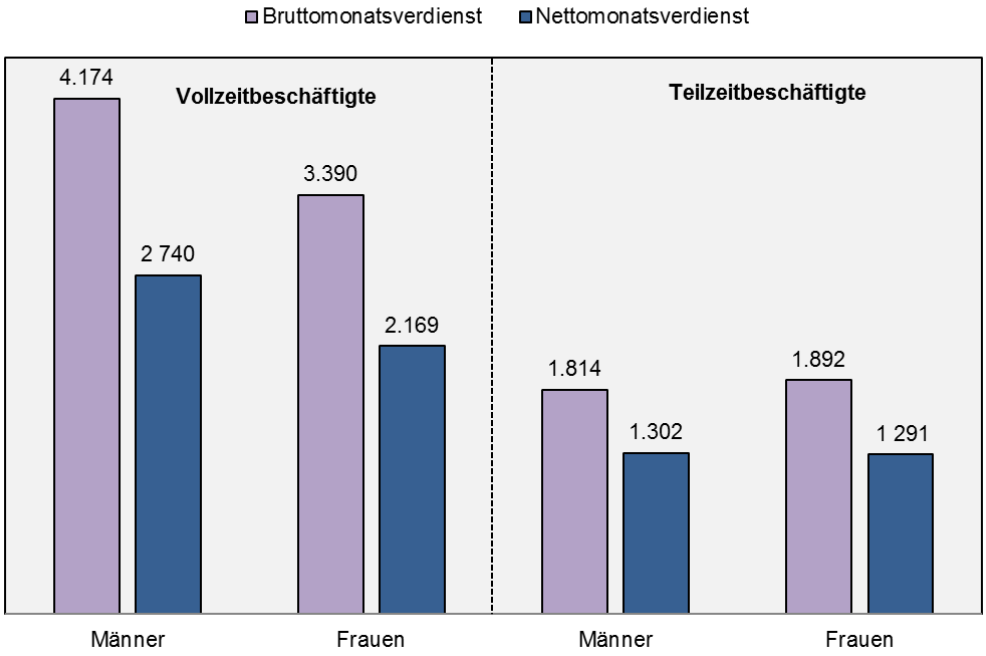
Household and age distribution profile

Lawaetz-Stiftung

Household expenditure as % of national average: _____

Household income (Individual wages) as % of national average: 106,1 %

Durchschnittliche Brutto- und Nettomonatsverdienste in Hamburg im April 2014



[Average monthly wages for men ("Männer") / women ("Frauen") in EUR, before ("brutto") / after ("netto") taxes, for fulltime ("Vollzeit") / part time ("Teilzeit") employed people]

Age distribution of all inhabitants (2017, in total)	**< 15**	**16-25**	**26-45**	**46-65**	**>65**
Male	132.965	99.188	279.754	241.984	144.386
Female	124.477	94.273	281.742	240.951	191.934

Employment profile

Total population in employment: 1.259.600 (employed, public servants and self-employed)

Participation rates in employment:

Male: 51% (Germany)_____ Female 41% (Germany)___

Hamburg, In total: 55,59%

Employment at Hamburg (2017)		
Sector	Total	In Percent
Agriculture, Foresty, Fishing	1 000	0,1
Producing Sector	147 043	15,4
Producing Sector (without Constructing)	114 329	12,0
Manufacturing	99 630	10,5
Constructing	32 714	3,4
Services	804 914	84,5
Trade, Traffic, Hotels & Gastronomy	263 775	27,7
Information and Communication	59 382	6,2
Finance and Insurances.	45 512	4,8
Estate and Housing	14 428	1,5
Freelancing, scientific, technical and other economic services.	196 403	20,6
Public administration, Defence, Social Security, Education and Training, Health and Welfare.	188 855	19,8
Culture, Entertainment and Recreation, other services; Priv. Households; Non-spatial organization.	36 559	3,8

Numbers employed by qualification level:
Source: Regionalreport über Beschäftigte - Kreise und Agenturen für Arbeit (Quartalszahlen und Zeitreihen) - Dezember 2018 – Hamburg, https://statistik.arbeitsagentur.de/Statistikdaten/Detail/201812/iiia6/beschaeftigung-reg-bst-reg/bst-reg-02000-0-201812-xlsx.xlsx

	Degree	Masters	PhD	Professional Qualifications	Without (professional OR academical qualification)	Qualification unknown
WITH social insurance, SUM: 991k	BA: 48k, MA/ German academic diploma (until Bologna process) 176k	34k (German professional "Meister", technical / professional schools)	14k	509k (excluding those mentioned in "Masters", excluding apprentices [mentioned in "without qualification"])	475k (including 30k in professional qualification programmes ["berufliche Ausbildung"]	125k
WITHOUT social insurance, SUM: 177k	20k			72k	42k	43k

Statistics do not include entrepreurs or self-employed people! (103k companies in Hamburg in 2017), some people are was well as self-eomploe

Retention rates of graduates in region:
No concrete data available. In Germany the rise of academic qualification started in the 1970s, these people will start to drop off the labour market in the next years.
Currently, women often interrupt their professional CV with the birth of the first children.

Education profile

Total population in education: at schools, vocational training and universities?
Eduation @ school is full time education (196k pupil, from pre-school to "Abitur", https://www.hamburg.de/contentblob/12142126/0d1b816c0d6ea2ddf55bab11360cf043/data/pdf-gesamtdokument-2018-19.pdf).
Also is the apprenticeship a fulltime qualification.
Most courses at universities are planned as fulltime courses, but in real life students, especially in the Master programmes, are working beside the courses, sometimes in their future profession, sometimes in "jobs".
Vocational training is sometimes a full-time training ("Fortbildung", "Umschulung"), sometimes a part-time training beside the regular job.
Percentage Full-time_____Part-Time_
Data not available

Participation rates in education: *at schools, vocational training and universities?*

Primary	**Secondary**	**Tertiary**	**Vocational**	**Further education**
132.102 (Grundschule und Stadtteilschule)	59.202 (Gymnasien & Steiner-Schulen)	108.965 (Universities – Hochschulen)	50.700 (vocational training - berufliche Ausbildung)	1.493 (Education of Adults - Erwachsenen-bildung)

Male: *number or percent?* _____Female _____
M/F rate is 50:50 (https://www-genesis.destatis.de/genesis/online/logon?sequenz=tabelleErgebnis&selectionname=21311-0005&zeitscheiben=1)

Number of students (at Universities!) by level: 108.965 (https://de.statista.com/statistik/daten/studie/255207/umfrage/studierende-an-hochschulen-in-hamburg/), no differentiation

Dropout rates by level:

Primary	**Secondary**	**Tertiary**	**Vocational**	**Further education**
	6,5%	No reliable data available, ca. 40% (=> job without examination, professional training, interruption)	29,7% (https://www.ausbildernews.de/ausbildungsabbruch-verhindern/)	n/a

Ca. 1100 pupil leave school without a certification (of 17k pupil who leave school in sum) (https://www.hamburg.de/contentblob/12142126/0d1b816c0d6ea2ddf55bab11360cf043/data/pdf-gesamtdokument-2018-19.pdf)

Number of Higher Education Institutions:

University		Institute of Technology		Technological University		Other
Public	Private	Public	Private	Public	Private	Universities of Applied Sciences (currently without OWN Ph.D. authorization)
1 (Universität Hamburg)	3	No own category	No own category	2 (Technische Universität Hamburg, HafenCity Universität Hamburg)		5 public, 14 private

Research and innovation profiles are “individual profiles”, often not specific for a whole university but for faculties etc.

Number of Research Centres:

Public	Private
38 **https://wissenschaft.hamburg.de/forschungseinrichtungen-hamburg/**	n/a

Number of Incubation Centres: https://www.hamburg-invest.com/starterkit/10559110/accelerator-inkubatoren/ (NO accelerators)

Public	Private
0	5

There are currently a number of activities for startup programs, also public programs,

Industry stock: 2016, http://www.buergerschaft-hh.de/parldok/dokument/66095/.pdf (Mittelstandsbericht 2018, S.17, table 4)

Tabelle 4: Unternehmen nach Wirtschaftsabschnitten und Beschäftigtengrößenklassen

WZ		Unternehmen [1] mit sozialversicherungspflichtig Beschäftigten von... bis...									
		Insgesamt		0 - 9		10 - 49		50 - 249		250 und mehr	
		Anzahl	SV-Besch	Anzahl	SV-Besch	Anzahl	SV-Besch	Anzahl	SV-Besch	Anzahl	SV-Besch
B	Bergbau und Gewinnung von Steinen und Erden	17	1.468	11	.	3	.	1	.	2	.
C	Verarbeitendes Gewerbe	3.180	125.811	2.501	4.330	457	9.780	152	17.679	70	94.022
D	Energieversorgung	447	5.586	417	150	14	268	10	1.400	6	3.768
E	Wasserversorgung, Abwasser- und Abfallentsorgung und Beseitigung von Umweltverschmutzungen	190	9.396	116	250	46	1.024	23	2.239	5	5.883
F	Baugewerbe	6.407	28.635	5.689	8.206	636	11.892	77	6.334	5	2.203
G	Handel; Instandhaltung und Reparatur von Kraftfahrzeugen	16.117	174.155	14.362	20.337	1.396	28.447	266	26.976	93	98.395
H	Verkehr und Lagerei	5.848	78.401	4.974	6.174	652	13.412	180	17.561	42	41.254
I	Gastgewerbe	5.665	36.623	4.920	9.086	645	12.254	90	8.578	10	6.705
J	Information und Kommunikation	6.709	55.416	5.892	5.801	613	12.996	178	17.238	26	19.381
K	Erbringung von Finanz- und Versicherungsdienstleistungen	2.250	34.497	2.032	2.732	148	3.086	46	5.461	24	23.218
L	Grundstücks- und Wohnungswesen	5.520	14.533	5.310	.	171	.	37	.	2	.
M	Erbringung von freiberuflichen, wissenschaftlichen und technischen Dienstleistungen	23.090	91.573	21.493	17.136	1.293	25.030	268	26.413	36	22.994
N	Erbringung von sonstigen wirtschaftlichen Dienstleistungen	6.605	99.798	5.724	6.468	582	12.461	225	23.257	74	57.612
P	Erziehung und Unterricht	2.193	36.458	1.884	2.035	234	4.650	60	6.520	15	23.253
Q	Gesundheits- und Sozialwesen	6.354	115.514	5.121	13.915	943	18.295	231	23.498	59	59.806
R	Kunst, Unterhaltung und Erholung	5.454	12.815	5.275	2.295	134	2.619	37	4.534	8	3.367
S	Erbringung von sonstigen Dienstleistungen	6.884	27.542	6.474	6.219	338	6.536	56	4.923	16	9.864
	B-N und P-S	102.930	948.221	92.195	109.534	8.305	166.131	1.937	196.113	493	476.443

1) Unternehmen mit steuerbarem Umsatz aus Lieferungen und Leistungen und/ oder mit sozialversicherungspflichtig Beschäftigten im Berichtsjahr 2016.

. = Zahlenwert ist nicht zur Veröffentlichung geeignet. - = Zahlenwert gleich Null

SV-Besch = sozialversicherungspflichtig Beschäftigte

Quelle: Statistikamt Nord (Unternehmensregister, Stand 30.9.2017)

MNEs Multinational Enterprizes (up to 250 employees)	**SMEs (**50-249 employees**)**	**Micro** (up to 49 employees)

493	1.937	92.195 (1..9) + 8.305 (10..49)

Industry stock by sector

Sector	**MNE**	**SME**	**Micro**	**Comment**
Energy (traditional & new?)	8	11	445	Mining, energy supply (B, D)
Maritime				
Manufacturing – heavy engineering	70	152	3958	includes light engineering
Manufacturing – light engineering	-	-	-	<no dedicated category>
Agriculture				620, no differentiation in classes (https://www.statistik-nord.de/fileadmin/Dokumente/Presseinformationen/SI17_006.pdf)
Agri. food				Included in D (manufacturing)
ICT	26	178	6505	WZ I, not only ICT, but not all ICT are included
Healthcare/-	59	231	6094	Only healthcare, no pharma industry, no research, WC Q
Tourism				n/a
Services – Financial	24	46	2180	WC K
Services - Creative industry				n/a
Other (specify)	See table			
Other (specify)				

R&D Investment:
https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/BildungForschungKultur/ForschungEntwicklung/Tabellen/FuEAusgabenBundeslaenderSektoren.html

Source of R&D funding	**2017**	**2016**	**2015**	**2014**	**2013**
Total Government spend on R&D in region		1.105			
% of national R&D spend		3,76			
Private sector spent on R&D in region		1 407			
% of national R&D spend		2,23			
Total EU R&D funding coming into the region		n. a.			
EU R&D funding as % of EU funding nationally		n. a.			

Part B: SWOT Analysis

Illustration: eDigiregion Project Team (2017)

Theme: Technology Orientation

How would you describe the technological orientation of the region?

https://www.hk24.de/produktmarken/beratung-service/konjunktur-statistik/hamburger-wirtschaft-zahlen/wirtschaftliche-entwicklung-sektoren/3676936#js-ct-content-0

Overview:	Hamburg has a strong tradition in trading and industry (transportation => Airbus, shipyards, transportation systems [Still, Jungheinrich], Mercedes). Two shares of about 32% (each) of the gross value result from [trade, traffic, information, tourism] respective [financial services, real estate services]. Industry is more important than in other metropolitan regions. The area of Hamburg is only 0.2% of the German area, but 2.2% of the German inhabitants are living in Hamburg (only the town, not the metropolitan region) – a high urban density with all advantages and disadvantages can be seen and must be handled.
Strengths - Capacities & capabilities	• Integration of (industrial) services and production • Science institutions that develop a network • Increasing start up scene • High attractivity for young people (national and international)
Weaknesses - Issues that need to be addressed	High dependency on port industry, not so much economical, but much more politically
Opportunities - Potential for innovation/S3 focus	historical situation in which different aspects come together: • science, start up and innovation are political topics … • … as well as renewable energy • … and “Smart City”, innovative city …

Threats - Constraints to be addressed	Growth of the town could be too fast (not enough apartments for people willing to go to Hamburg, collapsing traffic) • Lack of skilled employees

General comments/Observations *(Technology Orientation)*

Theme: Regional Attractiveness

How attractive is the region to/for:

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Investors	Skilled workforce, academically trained people, attractive for young people	High and increasing rents at the housing-market (low compared to London, Paris, New York and Tokio)	General openness in "public opinion"	Better spatial planning, divide of tasks with the region
Researchers	A lot of private and public universities, skilled work-force, highly liable and effective administration,	High rents at the housing-market	A lot of private and public universities	Better spatial planning, divide of tasks with the region

	attractive living conditions			
Innovators	A lot of private and public universities, skilled work-force	High rents at the housing-market, Expensive real-estates, eg. compared to Berlin		Better spatial planning, divide of tasks with the region
Inventors	A lot of private and public universities, skilled work-force			
Entrepreneurs		High rents at the housing-market, Expensive real-estates,		
Multinationals	Established international contacts			(Highly) dependent of US and Far East trade
Indigenous enterprises				
ICT Professionals	Long tradition in ICT programmes at universities High number of ICT companies	Demand exceeds offer Only few "lighthouse" ICT companies that are attractive for international professionals	Regional activities of government and HEI (ahoi.digital) Attractive (public and industrial 7 private) projects and employers (large companies as Otto, Airbus, …)	

General comments/Observations *(Regional Attractiveness)*

Hamburg is an open-minded and diverse City with five public universities, one public and many private Universities of Applied Sciences and Business Schools.

All partners and bodies for the maritime added-value-chain (Wertschöpfungskette) are present at Northern Germany.

Theme: Policy

What is the basis of policy in the region?

	Regional	**National**	**European**
RTD		Maritime Agenda 2025, Programs if the Federal Ministry of Economic Affairs, (Intended) projects of the German Maritime Center	
Innovation	Support of Clusters	Maritime Agenda 2025	
Enterprise			
Entrepreneurship			

What are your views on the effectiveness of these policies?

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
RTD	Well equipped research-centers	One weak aspect at Germany is in many cases the transfer of research into	Large research center (DESY) will develop strategies for general markets	

		the commercial use		
Innovation		The public policies are mainly not developing the innovations		
Enterprise		The new tendering of the subzidies for wind-energie was stopping the increase.		
Entrepreneurship				

General comments/Observations *(Policy)*

Theme: Triple Helix

How would you define the level of engagement between the Triple (Quadruple) helix partners in the region?

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Government → Industry	- Handels-kammer (chamber of commerce) is closely related to the government			- Currently the Handelskammer has internal problems for some years

University (HEI) → Industry	- proximity - wide range of courses - experience in industrial co-operations @ HEIs	- sometimes restrictive formal / legal and financial contraints for HEI	- start up centers - entrepre-neuship activities @ HEIs	
Government →University (HEI)		Sometimes too close ("Stadtstaat" => town and federal unit are the same)		
Government →University (HEI) →Industry	Government "wants" co-operations and support for local business		Current situation is open minded towards innovation and start-ups in co-operation of industry and HEI with political support	Policy changes
Government→University (HEI) → Industry → Civil Society			Current situation is open minded towards innovation and start-ups in co-operation of industry and HEI with political support	Civil society is sometimes critical against governmental planning and universities

General comments/Observations *(Triple (Quadruple) Helix)*

The federal system of Germany with the federal level and the states (Bundesländer) and divided tasks, responsibilities and budgets prevents sometimes a fruitful cooperation with a strategic view and vision. In many cases only smaller individual solutions can be realized.

Theme: Entrepreneurial environment (1 of 3)

Describes the region's entrepreneurial environment

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Overview	Efficient and reliable administration			
Ease of starting a business in the region	Well-trained employees	High rents for rooms, flats and offices		
Enterprise supports available for start-ups	Attractive living-conditions at Hamburg, mild weather, wide range of cultural activities and locations	Nearly no risk-capital available		
Enterprise supports available for growth		Nearly no risk-capital available		

Theme: Entrepreneurial environment (2 of 3)

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed

Enterprise support available for internationalisation		Many private Universities of Applied Sciences		
Availability of finance for start-ups		Nearly no risk-capital available		
Availability of finance for growth		Nearly no risk-capital available		
Availability of finance for internationalisation		Nearly no risk-capital available		

Theme: Entrepreneurial environment (3 of 3)

The different levels are unknown at Germany

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Entrepreneurship education at primary level The different levels are unknown at Germany				
Entrepreneurship education at second level	Some training companies @ schools	No systematic economy / business courses @ school		

Entrepreneurship education at higher level	Some courses exist …	… but only a few		
Entrepreneurship education for entrepreneurs	This kind of education is not known at Germany. But: there are subsidised consultings for start-up`s. And, considering the competition-legislation, for existing companies, eg by the Chambers.			

General comments/Observations (*Entrepreneurial environment)*

In Hamburg there are a lot of independent activities in schools and universities, but there is no "superstructure" for these activities.

Theme: Innovation ecosystem

How would you describe the region's innovation ecosystem?

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Overview	Idea of innovation is a relevant topic in the public discussion	- missing venture capital	- high number of relevant actors	- very dynamic situation, sometimes confusing

What is/are the mechanisms for doing research in the region?	- some strong relationships between industry and HEIs - government supports co-operation between HEIs in Hamburg with special programs	- lack of money @ HEIs	- ideas for science centers will be realised in the next years	- research support system has only a little regional base
What is the commercialisation process for research in the region?		No "unified commercialisation process", different stakeholders (private, federal research [especially @HEIs], national research))		
How easy is it for industry to engage with research centres?	HEIs want to co-operate, research centres look for co-operation partners			
How easy is it for HEIs (?) to engage with research in industry?		-sometimes complex formal processes (calculation, overhead costs)		

General comments/Observations (*Innovation ecosystem)*
- HEIs & government are changing the circumstances for co-operation and transfer, but this process needs a lot of time.

Theme: Clusters and Networks

This theme has two aspects:

- *Clusters* refers to groups of **sectors/industries** (e.g. ICT cluster, biomedical cluster, pharmaceutical cluster, etc.)
- *Networks* refer to **connected groups** such as Chamber of Commerce, specific sectoral networks (active engagement and sharing of knowledge between members evident), or **business associations** (e.g. Women in Business Network, Small Firms Association, etc.).

*NB: choose the specific cluster your region is analysing energy/blue sector/maritime**

Theme: Clusters and Networks (1 of 3)

Describes clusters and specifically energy* clusters in the region

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Overview	Renewable energy is desired by the actual government		**Energy:** Much wind at Northern Germany	Political problems in installing power lines across Germany - political problems in extending wind power
Support from federal government	Supporting the German **Maritime** Center	**Maritime:** Two cluster-organisations **Energy:** break caused by the new tendering of the subzidies	**Maritime:** Two cluster-organisations -	**Maritime:** Two cluster-organisations
Support from regional government	Supporting the **maritime** cluster of northern Germany (mcn)	**Maritime:** Two cluster-organisations	**-Maritime:** Two cluster-organisations	**Maritime:** Two cluster-organisations

Nature of cluster participants				

Theme: Clusters and Networks (2 of 3)

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** ---- Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Level of cooperation between cluster participants	Cooperation between the individual companies	**Maritime:** Different understanding of the objective of the cluster: while some members want an individual support of their companies, the public bodies, financing the activities, intent to foster the sector, the whole branch		
Level of Internationalisation of cluster participants	**Maritime:** Not existing **Energy:** Strong transnational cooperation			
Level of integration of the cluster within the regional innovation system **what is a "regional innovation system", compared to a cluster?**				

Influence of the cluster on R&D activities		**Maritime** cluster of Northern Germany: Low influence German Maritime Cluster: R&D as one of four fields of activities **Energy:** R&D happened mainly at the 90th, meanwhile the wind-technology is working well, offshore too.		

Theme: Clusters and Networks (3 of 3)

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Overview	Question not understandable	Question not understandable	Question not understandable	Question not understandable
Support from government	The cluster-networks (agencies) are subsidised by the States of Northern Germany and the Federal Ministry of			

	Economic Affairs.			
Network participants	Network exits, companies will co-operate within various "sub-networks"			
Internationalisation of the networks (Cluster??) in the region		The clusters are not working on an international level		

General comments/Observations (*Clusters and Networks)* Lawaetz-Stiftung

There are at least two **maritime** industry clusters or networks in Northern Germany:

One is the Maritime Cluster of Northern Germany (mcn), with offices in the five northern German states.

On the other hand, the office of the German Maritime Centre (Deutsches Maritimes Zentrum - DMZ), responsible for the whole Germany, is located at Hamburg.

While the mcn are funded by the regional states (Bundesländer), the DMZ is financed by the federal government.

Renewable energies have, after 30 years of research, development and subsidizing, become so competitive on an international scale that they have been experiencing a boom in many markets.

More than 300.000 jobs have nation-wide been created in the field of Renewable Energies over the past 25 years.

At northern Germany different former shipyards are constructing and manufacturing now parts for wind-mills, they are using their facilities and their experiences of working with steel and modern chemical fibres.

On the other side different Universities of Applied Sciences and Universities established new courses and research-projects.

Although 2018 saw a significant and painful consolidation within the industry with rising pressure on all stakeholders, the employment is not arising anymore, smaller and bigger companies have to struggle with financial problems.

There are nearly no producers of solar-panels at Germany anymore.

Theme: Regional Technological Development (RTD)/Innovation Funding

Describes the funding measures that support RTD in the region

	Strengths - Capacities & capabilities	**Weaknesses** - Issues that need to be addressed	**Opportunities** - Potential for innovation/S3 focus	**Threats** - Constraints to be addressed
Overview				In general, VC is missing. There are a lot of isolated activities.
Funding Instruments available for entrepreneurs				In general, VC is missing. There are a lot of isolated activities.
Funding Instruments available to support ICT businesses	- Professional networks - government & HEIs rose a research network (ahoi.digital)			
Funding Instruments available to support incubators/accelerator programmes				
Current tax incentives to support R&D, ICT R&D, other R&D…				

Describe the availability and accessibility to regional, national and European funding for RTD				

General comments/Observations (*RTD/Innovation Funding)*

Different Universities and Universities of Applied Sciences and maritime research-units can be seen along the coasts of the Northern – and Baltic Sea of Northern Germany, located at bigger cities like Hamburg and Rostock, Kiel and Bremen – and smaller like Elsfleth and Leer. Totally there is a wide range of experiences and skills.

Repowering and de-construction of the off-shore-windmills are an upcoming topic, for research, development and and commercial utilization.

Theme: Smart Specializations

1. What are the region's Smart Specializations?

Northern Germany can be regarded as a hot-spot of the production and transport of Renewable Energies

With the establishment of the cluster-agency in 2011 at Hamburg and especially with the joint project "NEW 4.0 – Norddeutsche EnergieWende" (Northern German EnergyTransition 4.0) a powerful network has been formed in which the German states Schleswig-Holstein and Hamburg could form a model regional for a successful load management.

2. How are these Smart Specializations developed?

The partners are realizing different projects for a sustainable energy supply system, an acceptance study was published, a 48 MW battery storage went into operation.

Eight working-groups are active:

1. Nets
2. Power-Management (regulating supply and demand of electricity)
3. Producing Electricity
4. IT
5. Regulating the Market

6. Marketing and Acceptance
7. Vocational Training and Life-Long-Learning
8. Integrated Management of the System

3. What is the sustainability of these Smart Specializations?

The project will end in 2020.

The project is financed by the Federal Ministry of Economy and Energy with 45 Mio €, investments up to 130 Mio € shall be initialized.

4. What Smart Specializations should the region focus on in the future?

Idea: Technologies for urbanization / smart cities.

5. Why these Smart Specializations?

Hamburg is the 2nd largest city at Germany, the metropolitan region is large (from North Sea to the Baltic Sea) with typical problems (traffic crossing the river Elbe is a bottleneck, real estate market) but attractiveness for people from abroad [even for unskilled]

6. What are the Strengths, Weaknesses, Opportunities and Threats for these Smart Specializations?

S: Hamburg is a good field for testing and implanting. Federal government and town government are identical. Hamburg is an attractive location with economic potential.
W: Within the metropole region, 3 to 5 federal governments have to collaborate
O:
T:

Part 2: Innovation capacity and needs of SMEs in Transition in Energy (or Blue Sector)

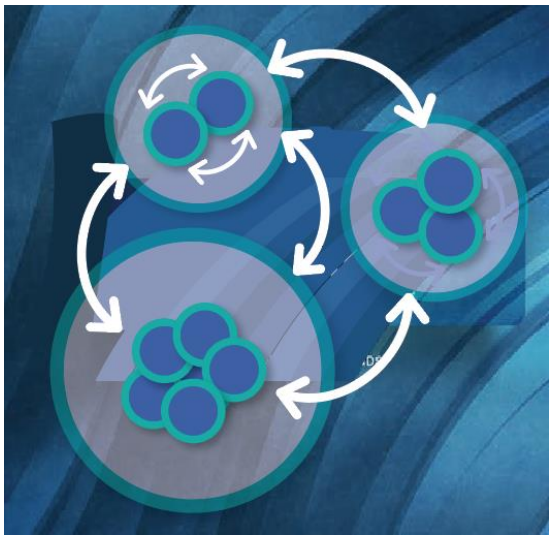


Illustration: Manickam (2018)

The interview schedule has been adapted from a doctoral thesis on cluster developments by A. Manickam in which qualitative systemic developments were captured. The focus of the thesis and the current research is to gain insights into stakeholder perceptions of dominant urgent challenges, initial conditions, potential opportunities for innovation and underlying processes constraining and supporting developments.

R. Weißbach & U. Schenck

Interview Questions: SMEs in Energy (or Blue) Sector

Topic	Question	Sub-question/detail	Answers
Defining who you are	What is your core activity in energy innovation?	• Details of business	Type of Business: … Size of staff: … Other: …
		• Geographic Scope	Local: Yes/No Regional: Yes/No International: Yes/No
		• Type of energy innovation	Product innovation: Yes/No Process innovation: Yes/No Service innovation: Yes/No Other: ….
		Details of energy innovation	1. … 2. …?
	Who is involved in energy innovation?	• Inside company	1. … 2. …
		• Outside company	1. … 2. …
Defining urgent challenges	What are 3 urgent challenges your company is facing?		1. … 2. … 3. …
	What possible solutions for the challenges?		1. … 2. …

			3. …
Defining path dependency	Which 3 factors, e.g. historical, geographical, cultural aspects, are important for your business?		1. … 2. … 3. …
	Which 3 factors are limiting your success?		1. … 2. … 3. …
Defining future strategies	How are you preparing for the future?		1. … 2. …?
	What is needed to be competitive for the future?	• New competences (training)	1. … 2. … 3. …
		• Research & innovation	1. … 2. … 3. …
		• Additional finance	1. … 2. … 3. …
		• New networks & collaborations	1. … 2. … 3. …
Defining direction	Which developments in energy transition seem promising for your company?		1. … 2. 3. …?

	Which developments are inevitable for your company?		1. … 2. … 3. …?
Leveraging innovation potential	Are you considering exploiting new ventures?	• New markets	Yes/No
		• New technologies	Yes/No
		• New products	Yes/No
		• New partners	Yes/No
		• Other…?	1. … 2. …?
Defining innovation steering	Who is driving or pushing innovation?	• Customers	• Yes/No
		• R&D	• Yes/No
		• Policy	• Yes/No
		• …?	• Yes/No
Defining emergent patterns	What is significantly different in the last three years?	• New partnerships & collaborations	1. … 2. …
		• Scope (local, regional, EU, international, etc.)	1. … 2. …
		• New (digital) communications	1. … 2. …
		• Knowledge sources and sharing	1. … 2. …
		• Innovation processes and solutions	1. … 2. …

Part 3: Job Forecasting and Skills Gap Analysis

The JOES was developed to study labour market developments through expected job vacancies and skills needed for the future of SMEs. The research group Human Capital at Hanze University of Applied Sciences Groningen developed this tool, led by Professor H. van Lieshout

[PASTE JOES – here]

Part 4: Conclusions

This part of the report captures the key findings of the regional innovation analysis and the implication for the future policy strategies. The following aspects to be presented in this part of the report:

- **Introduction**
- **Highlights of the analyses:**
  - ***Part 1 - Regional Innovation Ecosystems***
  - ***Part 2 – SME innovation capacity and needs***
  - ***Part 3 – Job Forecasting and Skills Gaps***
- **Key Conclusions of Parts 1-3**
- **Discussions of the Findings**
- **Inputs for new strategy and policy for Skills Education and SME innovation**

General questions to consider for this section:

- Do the Regional Innovation Ecosystems SWOT analyses, and that from the SMEs resonate with that of current Smart Specialization Strategies (S3) or its equivalent for the region as a whole? The energy (blue) sector?
- Are there differences in the views between policy/experts and SMEs?
- What do the Job Forecasting indications mean for the sector and the region's S3?
- Do the Skills Gaps identified by the iconic SMEs resonate with future plans for the region?
- What new skills trainings and innovation facilities need to be considered?
- What are strengths and good practices in the region that could be useful to support regional strategies?
- Are there threats (constraints) that could be better solved as an interregional North Sea challenge?
- Lessons learnt from the research experience
- Limitations and future research recommendations/plans

Appendix 1 – contact information

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…..

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Appendix 2 – Regional Innovation Ecosystems Mapping

The Regional Innovation Ecosystems has 2 parts. Part A are general information on the socio-economic and governance aspects of the region. Part B is an analysis of the various aspects of the innovation ecosystems through identifying their Strengths, Weaknesses, Opportunities and Threats as shown in the format. Experts from the economic and innovation policy departments can be invited to do this exercise. An analysis of the initial findings would then be presented to a panel of experts who represent a broader range of expertise, including t experts from policy, industry and academia involved in the regional development and the energy (or maritime sector). The aim of the panel discussions is to explore the initial findings and to expand and validate the findings and to reflect what implications these have for Smart Specialization Strategies (or its equivalent) and the future skills needs of the region.

Appendix 3 – SME analysis format

Please add the information from the individual interviews into this one format given below. Indicate [1], [2], [3], etc. next to the answers so that the answers are identifiable from each interviewee.

For e.g.:

• Type of energy innovation	Product innovation: [1], [4]
	Process innovation: [2], [4], [6]

• New competences (training)	1. data analysis skills - 3 companies [2], [6], [1] 2. network analysis – 2 companies [1], [3] 3. working in teams – 1 company [2]

Format SME innovation capacity and needs:

Format: Compilation of SME interviews			
Topic	**Question**	**Sub-question/detail**	**Answers**
Defining who you are	What is your core activity in energy innovation ?	• Details of business	Types of Business:
			Size of staff: …
			Other: …
		• Geographic Scope	Local: …. (how many)
			Regional: … (how many)
			International: … (how many)
		• Type of energy innovation	Product innovation: … (how many)
			Process innovation: … (how many)
			Service innovation: … (how many)

			Other: …. (what?)
		Details of energy innovation	(cut and paste answers) 1. … 2. …
	Who is involved in energy innovation ?	• Inside company	(cut and paste answers) 1. … 2. …
		• Outside company	(cut and paste answers) 1. … 2. …
Defining urgent challenges	What are 3 urgent challenges your company is facing?		(cut and paste answers) 1. … 2. …
	What possible solutions for the challenges ?		(cut and paste answers) 1. … 2. …
Defining path dependency	Which 3 factors, e.g. historical, geographical, cultural aspects, are important for your business?		(cut and paste answers) 1. … 2. …
	Which 3 factors are limiting your success?		(cut and paste answers) 1. … 2. …

Defining future strategies	How are you preparing for the future?		(cut and paste answers) 1. 2. …?
	What is needed to be competitive for the future?	• New competences (training)	(cut and paste answers) 4. … 5. …
		• Research & innovation	(cut and paste answers) 1. … 2. …
		• Additional finance	(cut and paste answers) 1. … 2. …
		• New networks & collaborations	(cut and paste answers) 1. … 2. …
Defining direction	Which developments in energy transition seem promising for your company?		(cut and paste answers) 1. 2. …?
	Which developments are inevitable for your company?		(cut and paste answers) 1. … 2. …?
Leveraging	Are you considerin	• New markets	… (how many)

innovation potential	g exploiting new ventures?	• New technologies	… (how many)
		• New products	… (how many)
		• New partners	… (how many)
		• Other…?	1. … (how many) 2. … (how many)
Defining innovation steering	Who is driving or pushing innovation?	• Customers	• … (how many)
		• R&D	• … (how many)
		• Policy	• … (how many)
		• …?	• … (what, how many)
Defining emergent patterns	What is significantly different in the last three years?	• New partnerships & collaborations	(cut and paste answers) 1. … 2. …
		• Scope (local, regional, EU, international, etc.)	(cut and paste answers) 1. … 2. …
		• New (digital) communications	(cut and paste answers) 1. … 2. …
		• Knowledge sources and sharing	(cut and paste answers) 1. … 2. …
		• Innovation processes and solutions	(cut and paste answers) 1. … 2. …

Appendix 4 – Job Forecasting & Skills Gap – JOES tool

Instructions….

Please ask…. ..

….

Please send the completed Excel sheets to the research team as indicated in Appendix 1.

Appendix 5 – The Regional Report

Format for Regional Report
(title page/layout for report sent later – liaise with WP2 Communication)

Region's Report
Colophon
Contents
List of tables & figures

Forward (by…?)
Introduction
Analysis of Regional Innovation Ecosystems [Part 1]
Analysis of Innovation Capacities and Needs of SMEs [Part 2]
Analysis of Job Forecasting and Skills Gaps of iconic SMEs [Part 3]
Conclusions [Part 4]

Appendices