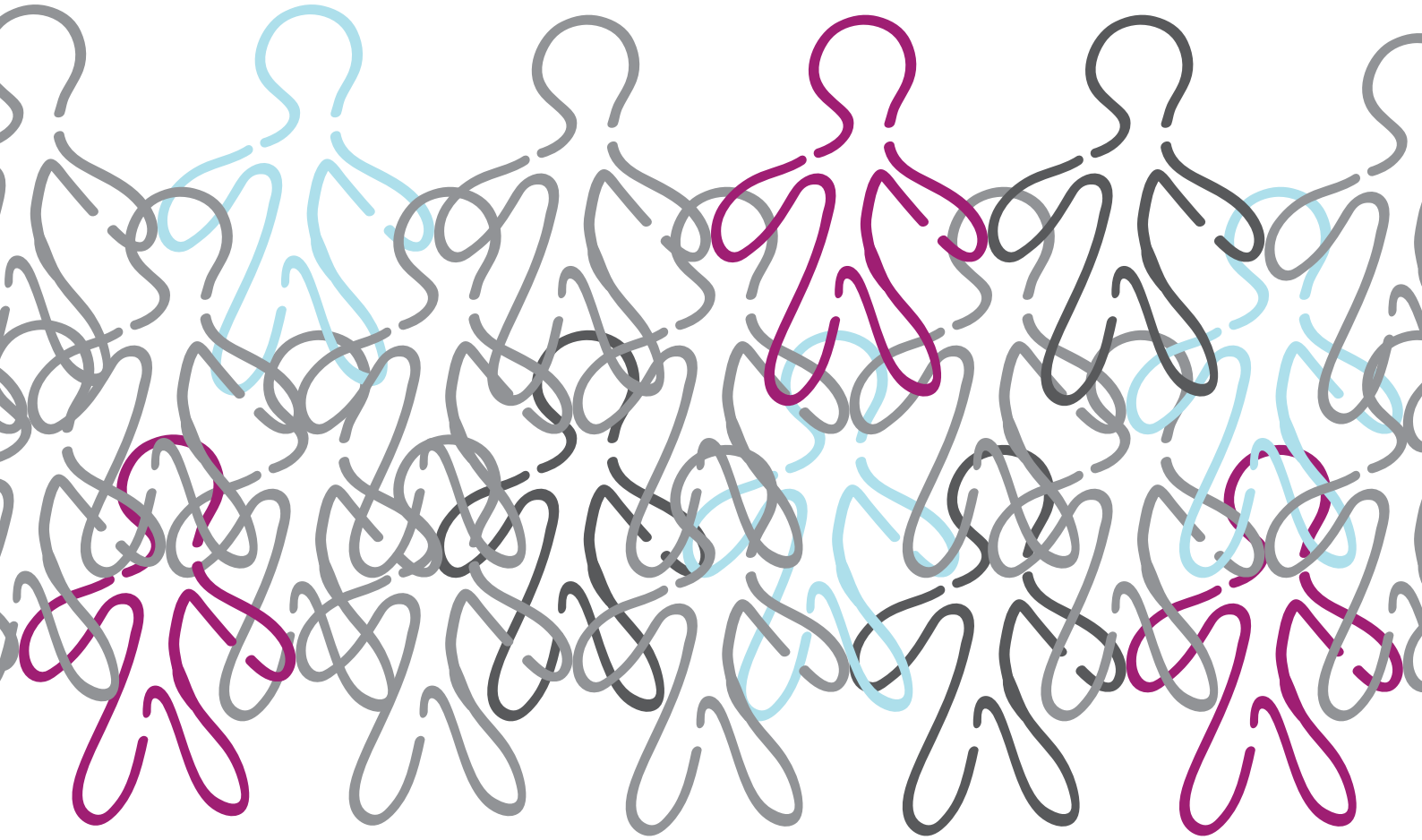

OPPORTUNITIES FOR BUSINESS COOPERATION IN THE FEHMARN BELT REGION

VÆKSTFORUM SJÆLLAND

belt femern LOGISTICS

REGION SJÆLLAND

By

Jesper Samson

Morten Heegaard Christensen

Per Homann Jespersen

Roskilde University

Dept. of Environmental, Social and Spatial Change (ENSPAC)

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Executive Summary

When identifying potential for trans-national cooperation the focus is on value chains, as it is concluded that the Fehmarn Belt Region has little short term-potential for cluster-building in the conventional sense. This is due to the geographical distances between the regions and their main urban centres. Also there are cultural, institutional and linguistic barriers that complicate cluster building. It seems likely that knowledge sharing mainly will take place through more or less formalized relations such as buyer-supplier chains or strategic partnerships, and rather less likely that this knowledge sharing will take place through informal face-to-face contacts in a local milieu. Instead of rejecting the cluster approach entirely, this study argues that the value chain perspective can be used in order to identify cooperation opportunities between the sub-regional clusters.

The regional business study in this report identifies the clusters or cluster-like formations in the sub-regions of the entire Fehmarn Belt Region. From this base point it will be possible to select business areas that are strongly represented in all or most of the sub-regions, and examine whether there are possibilities for establishing value chains/systems or even regional clusters in these business areas.

Table 1: Clusters or strong business areas by sub-regions

Business area	SH	Hamburg	MV	Berlin-Brandenburg	Capital Region DK	Region Zealand	Region of Skåne
Life Sciences (pharma, biotech, health)	X	X	X	X	X	X	X
Food industry	X	X	X	X	X	X	X
Cleantech	X	X	X	X	X	X	X
ICT and media	X	X	-	X	X	-	X
Transport and logistics	X	X	-	X	X	X	(X)
Maritime industries	X	X	X	-	X	-	(X)
Nanotechnology	-	X	-	-	-	-	X
Chemistry	-	X	-	X	-	-	-
Plastic	-		-	X	X	X	-
Tourism	X	X	X	X	X	X	X

Three case studies - life sciences, pig slaughtering and biogas for transportation - within the identified strong business areas are examined closer.

Life science clusters can be found in all the regions, and all the clusters have strong institutional support from dedicated cluster organisations. The share of transportation and logistics costs for a medical company are very small, since they spend most of their costs on research and development. The life science clusters are globally oriented and proximity primarily plays a role in terms of local connections and thus inside the clusters themselves.

The existence of strong sub-regional life science clusters does not in itself carry an imminent likelihood of transnational cluster building or value chains on a broad basis, even though some companies may find opportunities for cooperation.

The export of pigs from Denmark to Germany peaked in 2009 when 1.5 million live pigs were exported to German slaughterhouses. The future fixed Fehmarn Belt link will shorten the way from Zealand to the German market and especially to Eastern Germany, and this can have an impact on the export of pigs to Germany from Denmark. The toll for lorry passage will have a big impact on the actual realization of the potential. This value chain might not be very attractive in terms of innovation and ethics, but it is a fact that such value chains can also be advanced because of the fixed Fehmarn Belt link, provided the cost structure makes it attractive to transport live pigs to Germany.

Biogas is one of the renewable energies, which, according to the EU, should amount to at least 10% of energy usage for transport in 2020, with second generation biofuels counting double in this respect. It is recommended to concentrate the use of biofuels for road freight transport, ship transport and air transport. An assessment of the potential for a biogas corridor requires a stakeholder analysis throughout the entire biogas value chain with a view to establishing triple helix cooperation between companies, knowledge institutions and authorities in the three countries. There is potential for cooperation along this value chain, because bioenergy already plays a role in Denmark, Germany and Sweden, and because part of the transport system is likely to be converted to bioenergy and especially biogas. This implies an importance of trans-national coordination in order to have compatible standards and resources across the borders.

1 Introduction

The aim of this report is to give an overview of specialised business areas and clusters in the Fehmarn Belt Region in order to point to businesses with a potential for cooperation when the fixed link is ready. The method consists primarily of a review of existing cluster analyses supplemented by interviews with experts and business representatives. The report consists of an overview of clusters and business strengths in the sub-regions within the Fehmarn Belt Region followed by case-studies of three industries with potential for trans-national cooperation.

When identifying opportunities for trans-national cooperation the focus will be on value chains, as it is concluded that the Fehmarn Belt Region has little potential for cluster-building in the short term due to the geographical distances between the regions and their main urban centres. Instead of rejecting the cluster approach entirely, this study argues that the value chain perspective can be used in order to point to cooperation opportunities between the clusters.

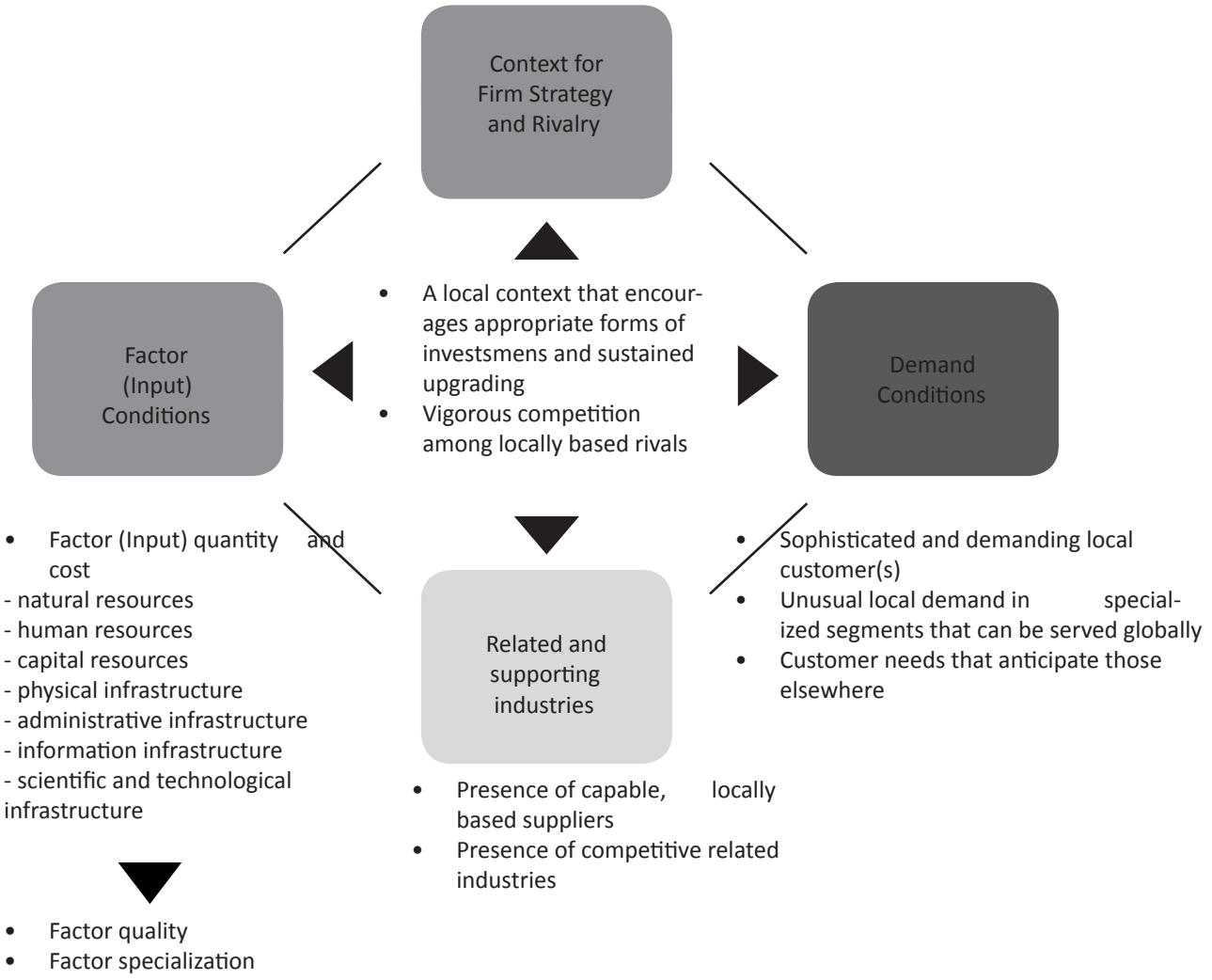
The focus of the study is on the Region Zealand and the Capital Region in Denmark, the Swedish Region Skåne, and the German federal states of Schleswig-Holstein, Hamburg, Mecklenburg-Vorpommern and Berlin-Brandenburg.

2 Clusters and value chains

Many studies have sought to build a fact-based foundation for strategic business policies. Cluster analysis has been the focus of many studies especially since Michael Porter's important contribution to the literature (1990, 1998, 2000). According to Porter; *"a cluster is a geographically proximate group of interconnected companies and institutions in a particular field, linked by commonalities and complementarities"* (Porter 2000).

The basic argument in cluster theories is that companies in these clusters have locational advantages because they hereby have access to a network of suppliers and customers. This means that production can be vertically disintegrated into specialised production networks while achieving external economies of scale. At the same time firms have access to other cluster attributes such as specialized labour, institutional support and not least situated knowledge (Asheim 2000).

Figure 1: Porter's diamond model. Source: Porter (2000)



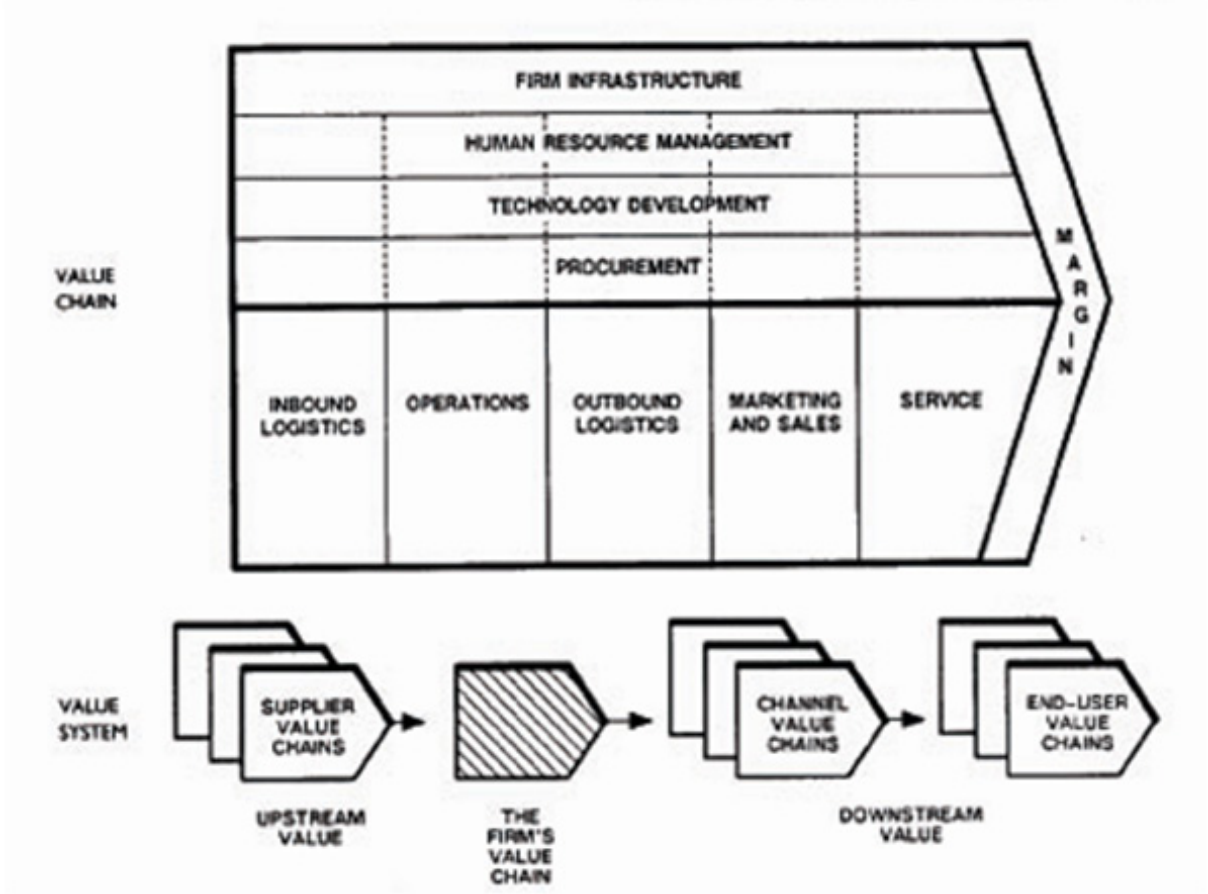
According to the cluster approach the primary goal of a local or regional development strategy should be to promote the clusters through concerted efforts, which improve all four attributes that affect competitive advantage (see figure 1). Local or national governments along with institutions such as universities, cluster organizations and chambers of commerce have the ability to improve some or all of these attributes.

The companies in a cluster compete and cooperate at the same time, which increases the competitiveness of the companies. Porter claims that clusters have the potential to affect competition in three ways; by increasing the productivity of the companies in the cluster, by driving innovation in the field and lastly by stimulating new businesses in the field.

Businesses are supported by a local/regional milieuconsisting of e.g. research institutions, governments, venture capital, local demand and a specialized labor force. Frequent face-to-face contacts and localized tacit knowledge are important factors for knowledge building and sharing in the clusters. A related angle to the cluster theories is the Scandinavian influenced approach on innovation systems and learning regions producing knowledge and innovation in interaction between public and private sector as well as the people living there (Lundvall and Maskell 2000). It has been argued that even though clusters are important for innovation and growth, it is imperative for these clusters to have global pipelines outside the clusters to obtain knowledge – often through more formal relationships, such as strategic partnerships or buyer-supplier relations (Bathelt et al. 2004).

The value chain approach is a more product-oriented way of examining opportunities for company cooperation. This approach analyzes functional business linkages as in the cluster approach, but leaves out the issue of geographical proximity, and thereby other aspects such as common labour markets and the more intangible aspects of knowledge sharing. While cluster cooperation can be both horizontal and vertical, value chain cooperation with several companies is typically vertical. Horizontal cooperation is in general between companies at the same level, while vertical cooperation is between companies in a buyer-supplier relationship in a value chain or production network.

The original value chain approach, also put forth by Michael Porter, describes a single company's activities, and the points of value creation for its products, but Porter has also considered value chains that extend beyond individual organizations. Those are termed "value systems" to describe a value chain that includes several corporations, each managing their own value chains (Porter 1991). An extended production network approach, also known as global value chains, acknowledges that value may not only be added within a single company, but most often includes several players and that value-adding activities may have everything from local to global scope (Gereffi et al. 2005).



The geographical dimension in cluster theory provides some problems when examining a larger area such as the Fehmarn Belt Region encompassing parts of Sweden, Denmark and Germany. The distances are long, particularly between the metropolitan regions and other densely populated areas in the corridor. Also there are cultural, institutional and linguistic barriers that complicate cluster building. It seems likely that knowledge sharing will mainly take place through more or less formalized relations such as buyer-supplier chains or strategic partnerships, and rather less likely that this knowledge sharing will take place through informal face-to-face contacts in a local milieu However, this does not rule out innovation, as there are also flows of knowledge in buyer-supplier relationships, especially in non-standardized production (Gereffi et al. 2005).

3 Regional business study

The objective of the regional business study is to identify the clusters or cluster-like formations in the sub-regions of the entire Fehmarn Belt Region. From this base point it will be possible to select business areas that are strongly represented in all the sub-regions, and examine whether there are possibilities for establishing value chains/systems or even regional clusters in these business areas.

3.1 Methodology

The regional business study is based on numerous other studies with a regional or national scope and initiated by regional or national political institutions and/or scientific research institutions (see section 5.2 for a list of sources). This also implies that the raw material for this study is gathered with different methodologies, and that the quality of the data might not be consistent. The studies also operate with different definitions of clusters or specialised business areas. However, as this study intends to show the strong business areas in the sub-regions without benchmarking them, it will be sufficient to bundle these studies and use them as a general guideline.

Industry-specific studies are not included, as they often have the intended purpose to promote the studied industry rather than others. It is worth remembering that regional studies might also be biased, as regional governments or business organizations seek to promote their region as a home for strong business clusters. It is especially tempting to promote the regions as home for attractive business areas in terms of innovation, value creation and future potential.

There are basically two different methodologies in order to do cluster studies; a statistical top-down approach and a sociological bottom-up approach. Both methods may very well be done in conjunction with each other at different stages of a cluster study.

The statistical top-down method is rooted in an analysis of standardized statistical data and typically consists of a measurement and identification of specialised business areas in terms of employment in the region or nation. This method has been advanced by Michael Porter and is also used by the OECD and in many other studies, which seek to benchmark clustered business areas in relation to the general employment pattern. Its main advantage is the broad identification and benchmarking of all specialised business areas in the region based on hard facts, while the main drawback is, that it is only able to identify established business clusters or cluster-like formations, while it also fails to recognize the functional linkages and localized competitive advantages, that are integral parts of true clusters (Graversen 2010).

The sociological bottom-up approach can have a statistical analysis as its starting point, but is in itself a qualitative research method based on interviews with experts and business actors or through a general survey of the business area. The preferred method is the so-called snowball method, which uses central actors to point to others actors in the business area, and then

continues this process until the cluster is fully mapped. The main advantage is the ability to point to new and upcoming clusters as well as clusters that span across the standardized statistical industry divisions. This method also identifies the most important actors and factors in the clusters. The main drawback is the inability to do benchmark studies, whilethis method can also be very resource intensive and still cannot be relied to be thoroughly comprehensive (Graversen 2010).

Value chain studies are also carried out by qualitative interviews with experts and/or representatives from the different links in the value chains. This way it is possible to identify how and where value is added to the final product, and where it might be beneficial to link companies in order to start or improve a value chain. It is possible to benchmark value chains and regional performance in relation to value chains, but value chain analysis is used here in order to find possibilities for establishing regional or inter-regional value chains and thus improve regional growth and regional innovation.

3.2 Results of the summary study

The following summary of existing regional business studies in the Fehmarn Belt Region gives an indication of where to search for specific businesses and companies who have a potential for growth and innovation through transnational cooperation. This chapter also includes a short description of these business areas, apart from life sciences which is elaborated as a separate case study, along with an assessment of the potential for cross-border business cooperation.

Table 1: Clusters or strong business areas by sub-regions

Business area	SH	Hamburg	MV	Berlin-Brandenburg	Capital Region DK	Region Zealand	Region of Skåne
Life Sciences (pharma, biotech, health)	X	X	X	X	X	X	X
Food industry	X	X	X	X	X	X	X
Cleantech	X	X	X	X	X	X	X
ICT and media	X	X	-	X	X	-	X
Transport and logistics	X	X	-	X	X	X	(X)
Maritime industries	X	X	X	-	X	-	(X)
Nanotechnology	-	X	-	-	-	-	X
Chemistry	-	X	-	X	-	-	-
Plastic	-		-	X	X	X	-
Tourism*	X	X	X	X	X	X	X

X = Existing cluster, potential cluster or cluster-like business representation. In the case of Berlin-Brandenburg the business areas are chosen on basis of kompetenznetze present. More on kompetenznetze: Seliger et al. (2008).

SH=Schlesweig-Holstein (incl. Lübeck, Flensburg, Kiel); MV=Mecklenburg-Vorpommern.

**The tourism sector is not characterized by clusters, but there are regional marketing platforms.*

Food industry (food processing, agriculture and farming) has a great impact in all the sub-regions and employs a high amount of people. The companies and producers are geographically dispersed, butthere are numerous competence networks and platforms in all the regions. The existing organisational infrastructure in the sub-regions could provide a backbone for further cooperation such as the Beltfood network, which aims at providing market information for the producers.[1] The industry is in general traditional and is not particularly innovative or globally oriented.[2] There might

1 Lis Andresen (2010), interview.

2 Lars Tomlinson (2010), interview.

be a basis for export of niche products and local specialities particularly in the metropolises.[3] The next chapter will include an examination of the already existing trans-national value chain of pig slaughtering.

Cleantech employs a rather low amount of people compared to other clusters, but the growth potential is considered to be very large. The sub-regions in the Fehmarn Belt Region all brand themselves as major cleantech growth centres (e. g. www.energie.brandenburg.de, www.cphcleantech.com and www.hamburggreencapital.eu). This could be a sector with opportunities for cooperation, but it will require further examination. The next chapter considers the potential for establishing value chains in biogas for transportation.

ICT and media. The ICT (information and communication technologies) and media clusters are located in and around Copenhagen, Hamburg and Berlin, in other words in the metropoles. While these clusters and the companies are important for the cities, it is not in the other parts of the region. There are no apparent opportunities for cross-border cluster building or large-scale value chains in these industries due to the cultural and linguistic differences, but faster and easier passenger transport through the fixed link might help break down these barriers. These industries rely in particular on human capital, and improved possibilities of face-to-face contacts and cultural exchange would strengthen the basis for transnational business cooperation.

Transport and logistics. The transport and logistics sector is highly dependent on the state of the market and economic activity in general. The sector is trans-national by nature, but this cross-bordering is driven by changing market demands in other sectors and less by the transport and logistics sector itself.

Tourism. The tourism sector is difficult to define as a cluster, even though there are regional and national platforms mainly focused on branding and marketing. The prospect of the fixed link has initiated a discussion about the opportunities to promote a common Fehmarn Belt Region in order to attract visitors (Destination Fehmarnbelt at www.visitfehmarnbelt.com). Mecklenburg-Vorpommern and Schleswig-Holstein have built a strong tourism brand with focus on e.g. water tourism, wellness and specialized health services. The tourism sector is in general focused upon interregional and international competition and not cooperation, but a common branding platform might be a good possibility.

3 Lis Andresen (2010), interview.

4 Case-studies

This chapter comprises of three case studies within the strong business areas identified in the regional business study.

4.1 Case: Life sciences

The definition of the life science sector includes all pharmaceutical and biotechnology companies and companies in the specialized health sector producing medical devices. The employment is in general characterized by high salaries and highly educated workers. Furthermore the sector is very dependent on research and development, venture capital and flows of knowledge. The companies in the life science sector are highly specialised and operate in very specific segments of the market.

Life science clusters can be found in all the regions, and all the clusters have strong institutional support from dedicated cluster organisations such as the Medicon Valley Alliance in the Øresund Region, Life Science Nord cluster in Hamburg and Schleswig-Holstein, BioCon Valley in Mecklenburg-Vorpommern and Health Capital Berlin-Brandenburg.

According to Matthiessen (2011) it might be possible to link the strong life science clusters in the Øresund Region and the Schleswig-Holstein/Hamburg region, when the fixed connection has been built, but this is contradicted by representatives from the Medicon Valley Alliance and German-Danish Chamber of Commerce. The clusters are oriented towards global nodes and not towards closer neighbours in particular.[4]

From the cluster level at Medicon Valley Alliance in the Øresund region of Denmark and Sweden, there is an international focus on the American and Asian markets and life science clusters there. On the cluster level they do not look at the opportunities for cooperation with the German clusters. The share of transportation and logistics costs for a medical company are very small since they use most of their costs on research and development.[5] The life science clusters are globally oriented and proximity primarily plays a role in terms of local connections and thus inside the clusters themselves.

The Fehmarn Belt Business Conference held at the 13th and 14th of September 2010 highlighted the difficulties in establishing cooperation between life science companies in Øresund and Germany. The planned life science workshop here was cancelled due to lack of interested companies.

4 Torsten Jepsen (2010), mail correspondence. Reiner Perau (2010), interview.

5 Torsten Jepsen (2010), interview.

The existence of strong sub-regional life science clusters does not in itself carry an imminent likelihood of transnational cluster building or value chains on a broad basis, even though some companies may find opportunities for cooperation. Some common platform-building already takes place, e.g. through the ScanBalt Bioregion network, but the creation of a trans-regional life science cluster would have to be supported by better infrastructural connections, which would facilitate face-to-face contacts and break down human barriers. It would also need a strong and concerted effort from relevant institutions, such as the existing cluster organizations along with universities and life science companies.

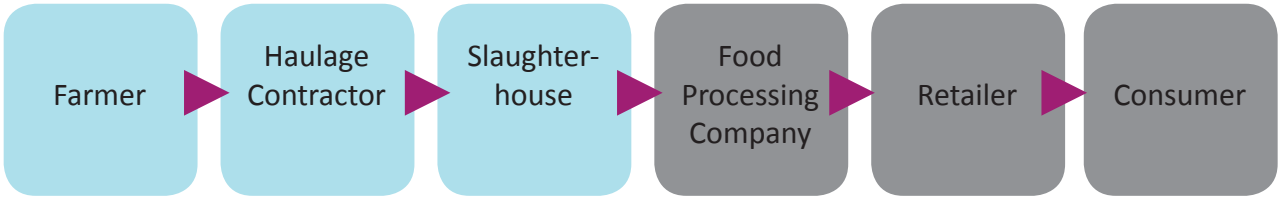
4.2 Case: The pork industry from farmer to slaughterhouse

Germany has more than 50 million pigs slaughtered every year, but Germany is still the world's largest importer of pigs since the consumption and demand of pork far exceeds the inland production (Landbrug & Fødevarer 2010).

The export of pigs from Denmark to Germany peaked in 2009 when 1.5 million live pigs were exported to German slaughterhouses. The difference in the settlement price (the price per kilo meat) is the main factor deciding the volumes of the export along with transport costs. The price differences are to a large degree decided by the lower German wages (Hamann 2009). The difference in the settlement price in the two countries came down close to zero in 2010. Therefore the export decreased to a level of around 800.000 pigs in 2010. The expectations for 2011 continue to point in a downward direction, although this can change rapidly.[6] It should also be noted that there is a large and growing export of 7.5 million Danish piglets to Germany, because of the large demand for pork along with a stagnation in the German production of own piglets and lower prices for Danish piglets (Bruun & Christiansen 2009).

This case study examines the future scope for export of live pigs from Danish farmers to German slaughterhouses, and therefore concerns the first half of the entire value chain of pork from farmer to consumer:

Denmark has approximately 4,000 farmers producing more than 3.3 million pigs for slaughtering with a weight higher than 50 kg out of a total of more than 12 million pigs. Most pig producers are located in Jutland in the western part of the country, although there are nearly 400 farmers in Region Zealand with more than 0.3 million pigs in their stock in 2009 (Statistikbanken 2010).



6 Udesen (2011), interview.

There is a regional difference in the competitive conditions for Danish farmers. Farmers located in western Denmark (especially in Southern Jutland) have lower transport costs to Germany than farmers in Zealand. This is due to the shorter distances and the toll for crossing the Great Belt Bridge between Zealand and Funen. In principle there are no legal obstacles for transporting live pigs with the ferries between Gedser-Rostock or Rødby-Puttgarden, but in reality this option is (almost) never used since the costs are simply too high.[7]

The future fixed Fehmarn Belt link will shorten the distance from Zealand to the German market and especially to Eastern Germany. This can have an impact on the export of pigs to Germany. The toll for lorry passage will have a big impact on the actual realization of the potential. If the price is too high, the potential will not be realized.[8]

The slaughterhouse business sector in Germany is concentrated in the north-western part of the country, although there are some very large plants in Eastern Germany (Hamann 2009). Due to a prospect of increased pig production in the early nineties, great amounts of subsidies were given to the slaughterhouses located in Eastern Germany. It turned out that the production of pigs decreased, and therefore these plants have a capacity utilisation of only 70-80 percent. This means that pigs from Denmark already are being slaughtered in Eastern Germany, despite the longer transport route.

The link in the value chain between the Danish pig farmers and the German slaughterhouses are the Danish haulage contractors, which are the most common form of sales outlet for the Danish farmers. The other option is for the farmers to negotiate directly with the German slaughterhouses. But for this they still have to find a carrier for the transportation, and this can prove difficult, because the haulage contractors wish to uphold their position in the value chain as buyers and sellers.[9]

The haulage contractors negotiate directly with the German slaughterhouses. Only a very few large producers (with more than 15,000-20,000 pigs) have tried to negotiate directly with the German slaughterhouses. In order to use this option, the Danish famers need to speak the German language and also have skills for negotiating a contract. Another option is to use the German producer organisation, but this option has never been used.[10]

Haulage Contractor

7 Udesen (2011), interview.
8 Udesen (2011), interview.
9 Udesen (2011), interview.
10 Udesen (2011), interview.

In the future the dominating sales outlet will probably still be the Danish haulage contractors. They have the advantage of both being transport providers and having the contacts and negotiating skills with the German slaughterhouses as well as the Danish farmers.[11]

The fixed Fehmarn Belt link will probably lower the cost of transportation of export of pork from eastern Denmark to Germany. This is a value chain that already exists, but might be further enhanced because of the fixed link, provided the cost structure makes it attractive to transport live pigs to Germany. This value chain might not be very attractive in terms of innovation and ethics, but it is a fact that such value chains also can be advanced because of the fixed Fehmarn Belt link.

4.3 Case: Biogas for transportation uses

The share of renewable energy in the transport sector should, according to the EU, amount to at least 10% in 2020, with second generation biofuels counting double in this respect. The Danish Climate Commission recommends to concentrate the use of biofuels for road freight transport, sea transport and air transport, because these forms of transportation seems to be the most difficult to electrify in the short term (Klimakommissionen 2010).

The production of biogas reduces the emission of greenhouse gasses in two ways. Firstly, it reduces the amount of methane and nitrous oxide, since these gasses otherwise will be released to the atmosphere by organic eruption of untreated slutty on the fields. This gives a large benefit for the climate since these gasses are important greenhouse gases. Through the consumption of biogas carbon emissions are reduced, since biogas can substitute fossil fuels that would otherwise be consumed (Energinet.dk 2010).

Biogas can be delivered directly to a combined heat and power (CHP) plant in pipes exclusively made for transportation of biogas. The advantage of this form is that it is unnecessary to clean the biogas for CO2. In Denmark the focus has been on the use of biogas in CHP plants. Since biogas consumption from the power plants is largest in the winter and less in the summer, the delivery of local biogas to a local power plant creates at large surplus of biogas production in the summer.

Biogas can also be injected into the gas network, where it can level seasonal fluctuations and thereby make use of the full potential of the biogas. By injecting biogas into the gas network, about 2-5 % of the energy consumption is lost in the process of upgrading the biogas for distribution through the existing gas pipelines. In order to be used for transportation, biogas has to be stripped from i.e. CO2 and ammonia, to become concentrated methane and chemically and physically equivalent to natural gas.

11 Udesen (2011), interview.

For transport there are two technologies: CNG (compressed natural gas) and LNG (liquid natural gas). LNG demands cooling below -160 C, but then has a high energy density suitable for use for heavy vehicles and ships. CNG technology is mostly used for smaller vehicles such as passenger cars. The two technologies also require different infrastructure at filling stations.

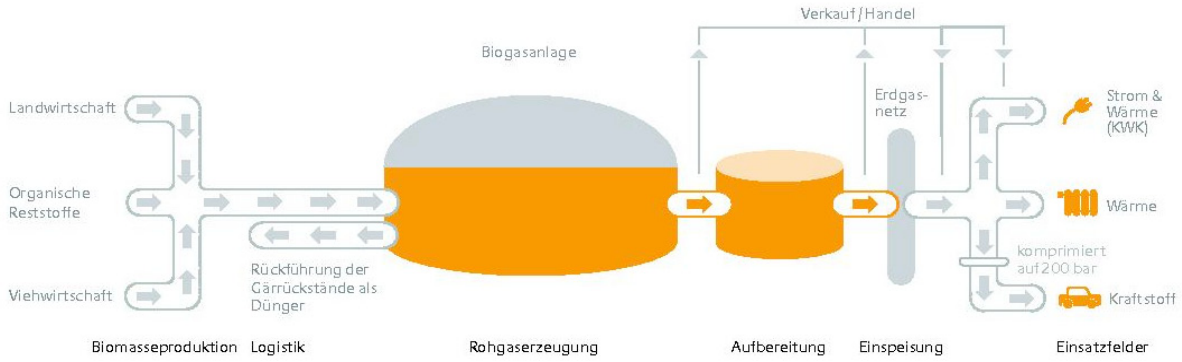
Denmark has a potential long term biogas supply of 60 PJ/year, but this scenario assumes that half of the energy supply will be from energy crops occupying 6 % of the arable land (Energistyrelsen 2010). A more realistic short term scenario is the aim of the "Grøn Vækst" (Green Growth) strategy, which targets a production equivalent to 12 PJ in 2020 compared to the current production of 4 PJ/year (Regeringen 2009). Even this lower target can be difficult to reach, as the establishment of new biogas plants has stagnated. Biogas for transport uses is currently not being subsidised, while other uses of biogas are being subsidised.

Forecasts for Sweden done by E. ON Sweden and Energigas Sweden expect a potential of 120-160 PJ (equivalent to 3-4 billion. m3 of gas) around 2040-50. In Sweden, biogas is currently being produced primarily from sludge and waste, while the vast majority of potential is based on expectations of thermal gasification of wood (Energinet.dk 2010).

In 2006, 80.6 PJ of biogas were generated in Germany. Of this, about 49% came from landfills and sewage treatment facilities. The other 51% of the biogas was produced in agricultural facilities using renewable energy plants (mainly maize), livestock manure, and fermented waste from restaurants and slaughterhouses. The German biogas production is highly subsidised, which results in attractive settlement prices, and therefore growing production. Biogas generation was expected to fall just short of 325 PJ in the year 2010; of this, the largest share – about 87% – would come from farms, specifically from plants, crop residues, solid and liquid manure, and grass cuttings from perennial pastures (GERBIO n. d.).

Current prognoses for Germany assume stagnation in the growth of solid and liquid manures and other waste materials. Powerful growth in the renewable energy plants sector is expected to counteract this. This growth should result from an increase in the planting area cultivated for biogas generation from about 0.55 million hectares in 2005 up to 1.6 million hectares in 2030, as well as a yearly yield increase of about 2% minimum. By 2030 biogas potential in Germany should reach 600 PJ, from which 420 PJ will be furnished from renewable crops (GERBIO n. d.).

Figure 3: Biogas value chain from raw material production to end-use. Source: (DENA 2010).



An assessment of the potential for a biogas corridor requires a stakeholder analysis throughout the entire biogas value chain (see figure 3 above) with a view to establishing triple helix cooperation between companies, knowledge institutions and authorities in the three countries. There is potential for cooperation along this value chain, because bioenergy already plays a role in Denmark, Germany and Sweden, and because part of the transport system is likely to be converted to bioenergy and especially biogas. This implies an importance of trans-national coordination in order to have compatible standards and resources across the borders.

5 References

Asheim, B. T. (2000): Industrial Districts: The Contributions of Marshall and Beyond. In: *The Oxford Handbook of Economic Geography*, pp. 413-431. Oxford University Press.

Bathelt, H., Malmberg A., & Maskell, P. (2004): Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography 28, 1*, pp. 31-56.

Bruun L. K., & Christiansen, M. G., (2009): *Eksport af smågrise til Tyskland*. Dansk Svineproduktion, Rapport nr. 35.

DENA (2010): *Erdgas und Biomethan im künftigen Kraftstoffmix*. Deutsche Energie-Agentur GmbH.

Energinet.dk (2010): *Gas i Danmark 2010 – forsyningssikkerhed og udvikling*. Energinet.dk.

Energistyrelsen (2010): *Anvendelse af biogasressourcerne og gasstrategi herfor*. Notat 3. maj 2010. Energistyrelsen.

GERBIO (n.d.): *National Report on current status of biogas and biomethane production – Germany*. Deliverable from Intelligent Energy Europe "GasHighWay" project.

Gereffi, G., Humphrey, J., & Sturgeon, T. (2005): The Governance of Global Value Chains. In: *Review of International Political Economy 12, 1*. Pp. 78-104.

Graversen, A. B. (2010): *Kortlægning og arbejde med klynger*. FORA - presentation held at Væksthus Hovedstadsregionen.

Hamann, K. (2009): *Analyse af den tyske svineslagterisektor*. Instituttet for Fødevarestudier & Agroindustriel Udvikling IFAU.

Klimakommissionen (2010): *Grøn energi – vejen mod et dansk energisystem uden fossile brændsler.* Klimakommissionen.

Landbrug & Fødevarer (2010): *Statistik svinekød 2009*. Landbrug & Fødevarer.

Lundvall, B. Å. & Maskell, P. (2000): Nation States and Economic Development: from National Systems of Production to National Systems of Knowledge Creation and Learning. In: *The Oxford Handbook of Economic Geography*, pp. 353-372. Oxford University Press.

Matthiessen, C. W. (2011): *Den faste Femern Bælt-forbindelse: Regionale udviklingsperspektiver*. Syddansk Universitetsforlag.

Porter, M. E. (1991): Towards a Dynamic Theory of Strategy. In: ***Strategic Management Journal*** *12*, pp. 95-118.

Porter, M. E. (1990): The Competitive Advantage of Nations. Free Press.

Porter, M. E. (1998): On Competition. Harvard Business School

Porter, M. E. (2000): Locations, Clusters, and Company Strategy. In: *The Oxford Handbook of Economic Geography*, pp. 253-273. Oxford University Press.

Regeringen (2009): *Grøn Vækst*. Økonomi- og Erhvervsministeriet

Seliger, G., Carpinetti L. C. R., Gerolamo M. C. & Fleschutz, T. (2008): Promoting innovative clusters and cooperation networks: the European Commission observatories of SMEs and the context of Berlin-Brandenburg. In: *International Journal of Networking and Virtual Organisations 5, 2,* pp. 204-223.

Statistikbanken (2010 - datatræk): *KOMB07 - besætningskombinationer med kvæg og svin efter område, type og enhed*.

5.1 Interviews

Andresen, L. (2010): Fødevareplatform Sjælland. Interview.

Jepsen, T. (2010), Medicon Valley Alliance. Mail correspondence.

Perau, R. (2010): Dansk-Tysk Handelskammer. Interview.

Tomlinson, L. (2010). Region Sjælland. Interview.

Udesen, F. (2011), Landbrug & Fødevarer. Interview.

5.2 Regional business studies

Braun, G. & Eich-Born, M. (2008): *Wachstums- und Innovationssysteme in Mecklenburg-Vorpommern – Förderpolitik auf dem Prüfstand.* Rostocker Beiträge zur Regional- und Strukturforschung, 21. HIE-RO Hanseatic Institute for Entrepreneurship and Regional Development an der Universität Rostock.

Copenhagen Economics & Inside Consulting (2005): *Udgangspunkt for vækst i Region Sjælland.* Det midlertidige Vækstforum i Region Sjælland.

Copenhagen Economics (2005): *Udgangspunkt for vækst i Region Hovedstaden*. Hovedstadens Udviklingsråd.

Copenhagen Economics & Prognos (2006): *Regional Effects of a Fixed Fehmarn Belt Link*. German Ministry of Transport & Danish Ministry of Transport and Energy.

Handelskammer Hamburg & IHK Schleswig-Holstein (2009): *Eckpunkte-papier der Handelskammer Hamburg und der IHK Schleswig-Holstein zu einer gemeinsamen clusterpolitik in Hamburg und Schleswig-Holstein*. HK Hamburg & IHK Schleswig-Holstein.

Kompetenznetze Deutschland (2010): *Overview of network and cluster activities by the federal states of Germany*. Agency of the Kompetenznetze Deutschland Initiative.

Matthiessen, C. W. (2011): *Den faste Femern Bælt-forbindelse: Regionale udviklingsperspektiver*. Syddansk Universitetsforlag.

Metropolitan Inc. (2010): *Metro-regions and their unique assets: An assessment of specialized clusters in Stockholm, Helsinki, and Copenhagen.* FORA.

Nilsson, M., Svensson-Henning, M., & Wilkenson, O. (2002): *Skånska kluster och profilområden – en kritisk granskning*. Region Skåne.

Oxford Research (2006): *Bruttoliste over Klynger og potentielle klynger i Region Sjælland*. Vækstforum Sjælland.

Regionomica & Georg&Ottenstöder (2009): *Regionales Entwicklungskonzept in Folge einer festen Fehmarnbelt-Querung*. IHK Schleswig-Holstein.

Schrader, K., Laaser, C.-F., Soltwedel, R. (2008). *Neue Wege der Kooperation – Schleswig-Holstein und Hamburg in einer gemeinsamen Wirtschaftregion*. Kieler Beiträge zur Wirtschaftspolitik 1. Institut fürWeltwirtschaft Kiel.