foodport
Connecting Food Port Regions
Between and Beyond

WP 5

Inter & Intra Regional Food Products Flows: Green Transport Corridors for Food Products

Summary Report

The Interreg IVB North Sea Region Programme

Investing in the future by working together for a sustainable and competitive region

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1 INTRODUCTION

As part of the Interreg IVB North Sea Region (NSR) Programme, the "Connecting Food Port Regions - Between and Beyond", or in short "Food Port" project, aims to develop the North Sea Region (NSR) as the best food cluster and hub in Europe for food products delivered via efficient and sustainable transport systems e.g. "green transport corridors".

The main focus of work package (WP) 5 is to enhance transport logistics market knowledge in support of the food industry. In activity 5.1 "Scan of Regional Food Clusters", the food industry sectors with the most potential for freight consolidation were identified. WP 5.2 "Inter and Intra Regional Food Product flows" focuses on the specific shippers in order to draw up an inventory of food product flows on a city level basis. These steps were followed to collect more information on food product flows: (1) Inventory of inter- and intra-regional product flows by standardised interviews with shippers, city of origin and destination, transport mode, volume, condition, freight type. (2) Matching food product flows and mapping of potential green transport corridors for consolidation of food products (rail, inland waterway, short sea shipping). Please notice that information regarding figures of food product flows is commercially sensitive information and therefore cannot be disclosed (non-disclosure agreements have been made with shippers).

A green corridor is considered here in a broad way, in terms of "sustainability", combining on one hand environmental and climate criteria and on the other hand economic (cost-efficiency) criteria. Setting up a corridor which is green in the (narrow) sense of being environmental-friendly, but not price competitive, will not be sustainable and could not be developed on a structural basis.

The structure of this summary report is: Section 2 – an introduction to the NSR countries as inventory of inter- and intra-regional food product flows; Section 3 - the mapping and matching of potential green transport corridors for consolidation of food products; Section 4 – the willingness and attitude towards co-operation, opportunities, and critical success factors and pitfalls for potential collaboration; Section 5 – the identification of green transport corridors for food products; Section 6 – the identification of other potential pilot projects for food products; and finally section 7 – the conclusion.

2 THE NSR COUNTRIES – AS INVENTORY OF FOOD PRODUCTS FLOWS

In WP 5.1 several major food products are identified as being animal feedstuff, meat (incl. poultry meat), oils and fats, dairy products and cheese, cereals, bread and cakes, and beer, soft drinks and mineral waters. Furthermore, we learned that up to 70 million tonnes of food trade between NSR countries in 2010 can be categorized into 12 major food types according to SITC[1] standard: live animal; meat; dairy and eggs; fish; cereals; vegetables and fruits; sugar; salt and honey; coffee, tea, and cocoa; animal feed; miscellaneous foods; beverage; and finally, tobacco.

Next the selected food sectors for each region are presented and followed by a brief description of business activities and the logistics requirements - see tables 1 – 7.

In Scotland, the focus of SEStran (South East of Scotland Transport Parntership) is on the following food subsectors: scotch whisky and fish (table 1). Southern Denmark focuses on pork, dairy, cereals, poultry, potatoes, fresh and frozen fish (table 2). In West Flanders (Belgium) focus

[1] Reference: http://unstats.un.org/unsd/trade/sitcrev4.htm

is on the following subsectors: fresh vegetables, fresh and frozen vegetables and potatoes, confectionary, chocolates, cereal derivates and beverages, see table 3. Västra Götaland in Sweden focuses on fish, spices, coffee & tea, peas, and meat. In Nordmødre & Romsdal in Norway (see table 4) and in Bremerhaven, Germany (see table 5) the focus is only on fish. In Yorkshire and Humber, England (see table 7) the focus of interviews is on bulk milk, cakes, meat and potatoes.

Table 1: Scotland (SEStran), UK

Food sector / Business activities	Logistic requirements
Scotch Whisky **Business activities:** 108 whisky manufacturing companies, employing 8,973 people	**Destinations:** USA, France, Spain, Singapore, South Africa, Germany, Taiwan, Greece, and United Arab Emirates **Volume:** 1.06 billion bottles of Scotch whiskey are delivered to overseas market. **Transport modes:** Road is the dominant transport mode, rail and deep-sea container ships
Fish Including demersal, pelagic, shellfish and salmon **Business activities:** 180 fish processing companies employing 8,012 people. Furthermore, 5,218 and 1,064 employees respectively work for the fishing and fishfarming industry.	**Destinations:** France, Spain, USA, Ireland, Italy, Germany, Netherlands, Russia, Portugal and Belgium **Volume:** 61% of the total fish trade volume **Transport modes:** Road transport with specialist refrigerated vehicles, and air freight transport (for the USA).

Table 2: Southern Denmark, Denmark

Food sector / Business activities	Logistic requirements
Pork Including live pigs, bacon, carcasses pigs/sows, cuts, by-products, canned meat and other processed products **Business activities:** All in all, 10 pork slaughterhouses are located in Denmark. 30% of the Danish pigs are located in Southern Denmark.	**Destinations:** Germany, UK, Poland, Japan, China, Italy, Russia, Australia, Sweden, and Hong Kong. **Volume:** 1,729,008 Tonnes **Type of food products and condition:** Fresh or frozen meat **Transport mode:** Fresh meat is mostly transported by road, however, export to the UK is done by ship and rail is used for Italy. Regarding frozen meat, a significantly part of export is shipped overseas in deep-sea containers.
Dairy Butter and Cheese **Business activities:** There are high concentrations of cattle in the region for dairy with almost 40% of the nation's cattle in the region.	**Butter** **Destinations:** UK, Sweden, Germany, Poland, Russia, United Arab Emirates, Lebanon, Greece, France & Egypt **Volume:** 45,548 Tonnes **Type of food products and condition:** Fresh, temperature controlled **Transport mode:** Butter is mostly transported by road, however, export to the UK is done by ship and rail is used for Italy.
	Cheese **Destinations:** Germany, UK, Sweden, Spain, Finland, Netherland, USA, France, Japan, and Greece **Volume:** 219,965 Tonnes **Type of food products and condition:** Fresh, temperature controlled **Transport mode:** Cheese is mostly transported by road, however, export to the UK is done by ship and rail is used for Italy.

Table 2: Southern Denmark, Denmark (continue)

Food sector / Business activities	Logistic requirements
Cereals **Business activities:** Measured by hectares about 28% of all cereals are farmed in the region.	**Destinations:** Germany, UK, Sweden, Spain, Finland, Netherland, USA, France, Japan, and Greece **Volume:** 219,965 Tonnes **Type of food products and condition:** Fresh **Transport mode:** Road
Poultry Fresh and Frozen **Business activities:** There is a strong concentration of poultry in the region with almost 60% of slaughter chickens and over 50% of all poultry.	**Destinations:** Sweden, UK, Germany, Russia, Malaysia, Hong Kong, Netherland, For. Arab. Emir., France, South Korea, & Singapore **Volume:** 96,300 tonnes **Type of food products and condition:** Frozen poultry and fresh poultry **Transport mode:** Frozen poultry are shipped for overseas markets, but also transported by trucks like fresh poultry
Potatoes Potato flour and frozen potato **Business activities:** The potato industry in Southern Denmark is the largest potato centre of Denmark, hosting some of Denmark's main potato manufacturers.	**Destinations:** Germany (8,000 tonnes), UK (15,000), Russia (17,000 tonnes), China (8000, Sweden (400 tonnes), Italy (2000), France (5000), Belgium, and Poland **Volume:** 60,000 tonnes **Type of food products and condition:** Starch and flour (more than 50% of potato harvest), fresh potatoes and frozen, temperature controlled **Transport mode:** Pallets and flour sacks on ordinary full-loads and silo-trucks
Fish (fresh and frozen) There are 6 important processing companies present in the area of Southern Denmark. **Business activities:**	**Destinations (imports):** Norway –southern part of Norway (fresh fillet), Chile (frozen fillets), Pacific, Faroe Islands. **Destinations (export):** Germany, France, Italy, Belgium, Netherlands, Luxembourg **Volume:** 40,000 tonnes **Type of food products and condition:** Frozen fish and fresh fish **Transport mode:** Pallets and mostly road transport

Table 3: West Flanders, Belgium

Food sector / Business activities	Logistic requirements
Fresh vegetables **Business activities:** 50% of the vegetables and fruit processing and preserving companies[2] are located in this region, employing 61,7% of the total employees in this subsector	**Destinations (import):** Netherlands, France, Spain, Germany, China, Israel, Italy, Poland, Portugal and UK **Destinations (export):** Germany, France, Netherlands, UK, Italy, Russia, Spain, Luxembourg, Sweden, and Austria **Volume:** 2.500.000 tons/year (potatoes included) **Type of food products and condition:** Fresh, temperature controlled (between 0ºC and 7ºC) **Mode:** Often pallets **Transport mode:** Mostly road transport (rail and water still exceptional on the continent)
Frozen vegetables **Business activities:** 11 companies in the frozen vegetables industry and 15 companies in the frozen potatoes industry	**Destinations (export):** Italy, Germany, UK, France, Sweden, Denmark, Spain, and Czech Republic. **Volume:** 1.000.000 tons/Year **Type of food products and condition:** Frozen, temperature controlled (between -18ºC and -21ºC) **Mode:** Often pallets **Transport mode:** 90% of the exported goods are transported by road. Road-rail is utilized for Italy. **Freight type:** Intermodal transportation: Diesel-electric 45ft. Pallet wide reefer container (33 euro pallets)
Fish (Including shellfish and mollusc) 60% of the fish processing and preserving companies are located in this region, employing 79,6% of the total employees in this subsector	**Destinations (import):** The Netherlands, France, Bangladesh, India, Denmark, Iceland, China, Vietnam, United Kingdom, and Germany **Destinations (export):** France, Netherlands, Germany, Spain, United Kingdom, Luxembourg, Italy, Denmark, Portugal, and Morocco **Type of food product and condition:** Frozen (-18 & -20º) and fresh (0º) **Mode:** Often pallets **Transport mode:** Mostly road transport (rail and water still exceptional on the continent)

[2] More than 26 companies.

Table 3: West Flanders, Belgium (continued)

Food sector / Business activities	Logistic requirements
Fast moving consumer goods: Production of sugar, chocolates, cereal and beverages **Business activities:** Various companies spread over West-Flanders, often SME enterprises.	**Import Destinations:** **Sugar:** France, Netherlands, Germany, UK, India, United Arab Emirates, Italy, Malawi, Spain, and Hungary. **Cocoa:** Netherlands, France, Ghana, Côte d'ivoire, Germany, Italy, Nigeria, Spain, Togo, and UK. **Cereals:** France, Netherlands, Germany, Italy, UK, Spain, Poland, Luxembourg , Czech Republic, and Sweden **Beverage:** France, Germany, Netherlands, UK, Spain, Italy, Austria, Portugal, Luxembourg, and Chile **Volume:** 5.6 billion Euro **Export Destinations:** **Sugar:** Netherlands, Germany, France, UK, Greece, Italy, Spain, United Arab Emirates, Syrian Arab Republic, USA **Cocoa:** France, Germany, Netherlands, UK, USA, Italy, Japan, Spain, Canada, and Sweden. **Cereals:** France, Netherlands, Germany, UK, Italy, Luxembourg, Spain, Sweden, USA, and Switzerland **Beverage:** France, Netherlands, Germany, UK, Luxembourg, USA, Italy, Spain, Japan, and Canada **Volume:** 7.5 billion Euro **Type of food product and condition:** Mostly ambient, chocolate products temperature controlled (14-18^{o}) **Mode:** Often pallets **Transport Mode:** Mostly road transport (rail and water transport still exceptional on the continent.)

Table 4: Västra Götaland, Sweden

Food sector / Business activities	Logistic requirements[3]
Fish (frozen or ambient) **Business activities:** 4 fish processing companies	**Destinations (import):** Norway **Destinations (export):** Scandinavian countries
Spices **Business activities:**	**Destinations (import):** Europe, Spain, USA, South Africa, Thailand **Destinations (export):** Nordic Countries, Benelux region, Baltic-region and UK **Transport mode**: RORO-solutions and trucks
Coffee & Tea **Business activities:**	**Destinations (import):** South- and Central America, Eastern Africa, Asia, and China **Destinations (export):** Denmark, Norway, Estonia, and Latvia **Transport mode:** Rail and sea freight truck
Peas (frozen) **Business activities:**	**Destinations (export):** Italy and Spain **Transport mode:** Truck
Meat (processed Food) **Business activities:**	**Destinations (import):** From Spain – Luxemburg - Malmö **Transport mode:** Rail

[3] Volume figures are not available.

Table 5: Nordmøre & Romsdal, Norway

Selected food sector / Business activities	Logistic requirements
Fish **Business activities:** 120 companies involved in seafood export. Catch by Nordmøre and Romsdal fishing fleet is worth NOK 3.2 billion, which is 25% of Norwegian catches by weight and value.	**Destinations (main):** Continental Europe, Russia, and Asia **Volume:** More than 500,000 ton **Main freight type:** Road pallet-wide trailer mostly palletised freight. Full truck load, approx. 18 tons fresh, chilled fish/trailer load. There is almost no sea transport.

Table 6: Bremerhaven, Germany

Food sector / Business activities	Logistic requirements
Fish (fresh fish) **Business activities:** Overall, over 200 companies were identified as being directly or indirectly involved in the value chain for secondary processors, wholesalers, retailers, and consumers. About 30 firms belong to the categories of storage, transport and logistics and about 41 to wholesales trade, import and export. 16 companies are dealing with fishing or processing, and retailing of fresh fish	**Destinations (import):** Denmark, the Netherlands, and Norway **Volume (import):** 175,103. **Destinations (export):** United Kingdom, Sweden, Norway, Netherlands, and Belgium **Volume (export):** 36,199 ton. **Mode:** Containers and trailers with pallets and boxes **Transport mode:** Sea (short sea and deep sea shipping), by road (containers or trailers)and rail

Please notice that not enough interviews could be carried out in the region of Yorkshire & Humber, England, UK to collect sufficient, qualitative information on food products flows to (inbound) and from (outbound) the region.

3 MAPPING AND MATCHING OF **POTENTIAL** GREEN TRANSPORT CORRIDORS FOR CONSOLIDATION OF FOOD PRODUCTS

From table 7 several opportunities for matching transport corridors for consolidation of food products are identified.

The first potential sustainable transport solution might be sea freight of fish and seafood from Mid Norway (Hitra) towards Norway's largest export countries: Denmark, Sweden, Germany and Belgium. Because Denmark transports large volumes of fish flour as fish food to Norway this might be a possible return shipment. Zeebrugge in Belgium is also a possible hub, because of the connections to Southern Europe and because of substantial volumes of vegetables and fruits which are transported from Belgium towards Norway.

A second possible match of transport corridors is sea freight of whisky and fish from Scotland via Zeebrugge (hub) towards France and Netherlands through Belgium with a return shipment of frozen vegetables from Zeebrugge towards the UK.

Table 7: Trade among NSR countries

Origin, City, Country	**Type of food product/ Transport mode**	**Import or Export to destinations**
Hitra, Norway	Fresh Fish	**Export:** Sweden (Gothenburg)
		Export: Denmark (Thyborön)
		Export: Germany (Bremerhaven)
		Export: Benelux + France
Grangemouth, Scotland	Port for Whisky	**Export:** Benelux
		Export: France
Shetland, Scotland	Major pelagic hub	**Export:** Netherlands (Rotterdam)
Rosyth, Scotland	Port for Whisky	**Export**: Germany
Teesport, Scotland	Port for Whisky	**Export:** France
Glasgow (Bellshill), Scotland	Shellfish and salmon	**Export:** France
Göteborg, Sweden	Peas	**Export:** Germany
		Export: Great Britain
	Meat	**Import:** Spain
	FMCG	**Import:** Belgium
Esbjerg, Denmark	Fish flour/Fresh fish	**Import/Export**: Norway
	Meat, and potatoes	**Export:** Harwich and Immingham, England
	Fish	**Export:** France
Bremerhaven, Germany	Fresh fish	**Import:** Denmark (Padborg)
		Export: Netherlands (Rotterdam)
		Export: France (Boulogne-sur-Mer)
West Flanders: Ardooie, Staden and Langemark, Belgium	Frozen vegetables and frozen potatoes	**Export:** Norway (West and Mid Norway)
		Export: Sweden (Malmö)
		Export: Denmark (Copenhagen)
		Export: England (London)
		Export: Germany (Ruhr and Bayern)
		Export: France (Lille, Paris area, Marseille)

The third possible consolidation option is the one of freight flows from Spain via Luxemburg (and perhaps via Belgium) and Malmö towards Göteborg.

Interviewed food manufactures in Southern Denmark face difficulties utilizing the existing opportunities for intermodal goods transport (DFDS: Esbjerg–Harwich and Esbjerg–Immingham) due to a lack of volume, pricing, and lead time requirements. Instead they mainly use road freight for food products to the UK (or reduce their export to the UK). Further investigation is needed to identify this fourth possibility for consolation of food products from Denmark to the UK.

Table 9 and 10 illustrate the identified food flows between the NSR countries and respectively the European and overseas markets.

Table 9: NSR countries and other European markets

Origin	Type of food product/ Transport mode	Import or Export to/from destinations
Peterhead & Fraserburg, Aberdeen, Scotland	More than 50% of the Scottish fish landing	**Import:** Whitefish from Faroes and Iceland
Denmark	Meat	**Export:** Italy
Tillbury, Scotland	Port for Whisky	**Export:** Italy
Göteborg, Sweden	Peas	**Export:** Italy
West Flanders: Ardooie, Staden and Langemark	Frozen vegetables import/exports	**Export:** Italy (Milano area)
West Flanders: Ardooie, Staden and Langemark	Frozen vegetables import/exports	**Export:** Spain (Navarra – Catalonia area)
Göteborg, Sweden	Peas	**Export:** Spain
Greenock, Scotland	Port for Whisky	**Export:** Spain
Rosyth, Scotland	Port for Whisky	**Export**: Eastern Europe
West Flanders: Ardooie, Staden and Langemark	Frozen vegetables	**Export:** Czech Republic (Prague area)

Table 10: From NSR countries and overseas markets

Origin	Type of food product/ Transport mode	Destinations
Liverpool, England	Port for Whisky	**Export:** North America
Grangemouth, Scotland	Port for Whisky	**Export:** Via Felixstowe, Tilbury or Antwerp for America
Grangemouth, Scotland	Port for Whisky	**Export:** Via Felixstowe, Tilbury or Antwerp for Asia Pacific
Shetland, Scotland	Major pelagic hub	**Export:** East Asia
Shetland, Scotland	Major pelagic hub	**Export:** Russia
Shetland, Scotland	Major pelagic hub	**Export:** Nigeria

4 THE WILLINGNESS AND ATTITUDE TOWARDS COOPERATION , OPPORTUNITIES, AND CRITICAL SUCCESS FACTORS AND PITFALLS FOR POTENTIAL COLLABORATION

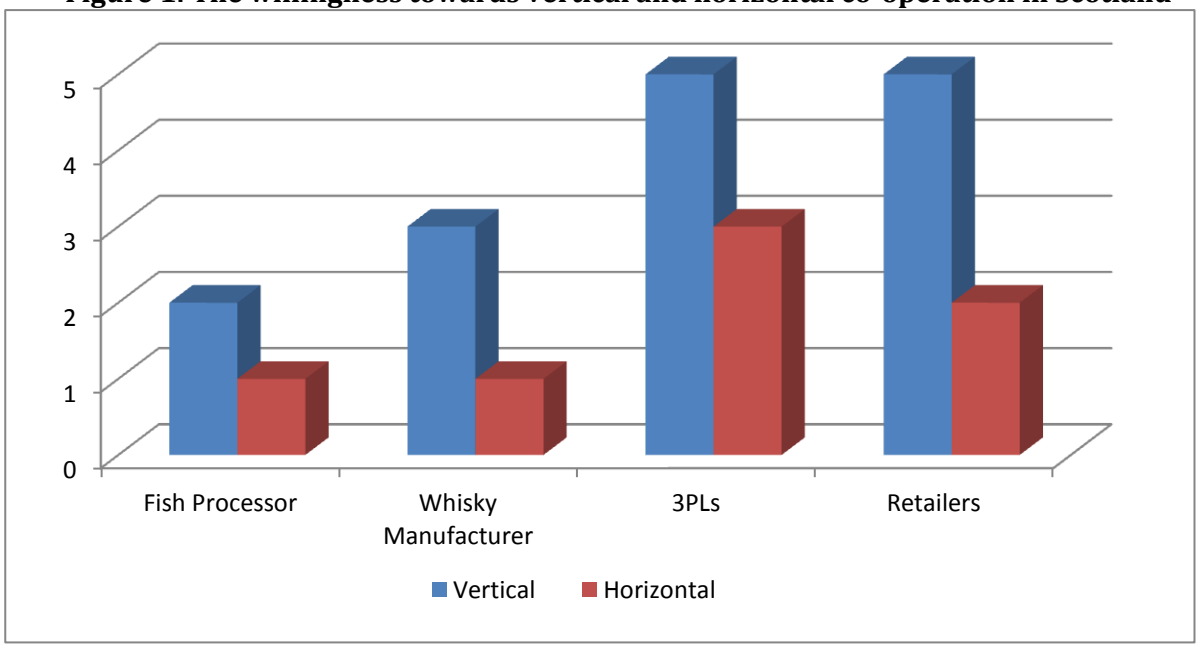
This section describes the willingness and attitude and opportunities for potential collaboration in regard to logistics, but also the perceived critical success factors and pitfalls in collaboration between shippers within the partner regions.

During interviews, attitude and willingness toward logistics co-operation has been set on a scale from 1 to 5 ranging from a low to a high willingness. The willingness for logistics co-operation in Scotland and Denmark are shown in figure 1 and 2.

SCOTLAND, UK

As shown from figure 1 regarding the Scottish market, fish processors show least willingness in both vertical and horizontal logistics co-operations. It is because most fish processors are small or medium size business and they have less control over the whole supply chain. However, they are looking to pick up some loads like packaging boxes, fruit and vegetable to avoid empty backhauls. Cost efficiency is obviously their major concern. The overall evaluation of whisky manufacturers was not as high as expected. It becomes understandable when focusing on the industrial structure and corresponding market power of dominant players. High concentration of whisky manufacturing in Scotland creates massive volume for each company and therefore they would like to approach the end of supply chain as close as possible.

Figure 1: The willingness towards vertical and horizontal co-operation in Scotland



Note: The willingness has been further broken down to vertical and horizontal co-operate in order to get some deep insights.

In the Scottish fish focus is on service frequency, which is very critical for the fresh fish exports. In contrast, whisky manufactures are more concerned on service effectiveness and sustainability, because whisky manufactures need to have their deliveries perfectly aligned to shipping schedules.

Finally, globalisation further drives both whisky and fish companies to seek for seamless supply chain through logistic co-operating. For example, the rapid expansion of the whisky market in Far East and South America, and the outsourcing of fish processing business from Europe to China and Thailand.

Perceived pitfalls are technical issues constrained by the condition of delivering products, arrival time and seasonality. Technical issues are mostly the concern of the fish processors when talking about freight flows matching on both inbound and outbound journey. Groupage of different products needs to be carefully considered in regard to the mix-loading compatibility. Regarding arrival time and seasonality, the companies argue that logistics co-operation should not be purely based on the extremely tight time requirement, but also a sustainable collaboration throughout all the different seasons. Again, it is a big challenge to fish industry.

There are also some constraints on general cargo sectors. For example, the shortage of maritime containers is a very serious issue for Scottish drink exports. It is interesting to find out in the interviews that retailers and whisky distillers are discussing how to solve the imbalance issue, which would be a huge influence on intermodal flows to/from Scotland. Both sides appear to be trying to convince the other to use the same type of container and just tranship the load at one end. It could be that the savings made from matching the flows would outweigh the cost of transloading. However the distillers are not keen on this idea because they don't want their high value cargo to be handled any more than is necessary, and the retailers do not feel that the extra repositioning costs paid by Scottish shippers is their problem; so they have no motivation to inconvenience their operations.

Another on-going concern voiced by hauliers is the difficulty for small users to switch to rail, ranging from the requirement to provide their own containers to their need for door to door quotes. Access has been reduced as the UK rail industry has seen a major decline in wagonload services over the last few decades. Better information for potential shippers is also required regarding train services, timetables and wagon capacity. Due to a lack of marketing and information availability, rail is often not visible to prospective customers.

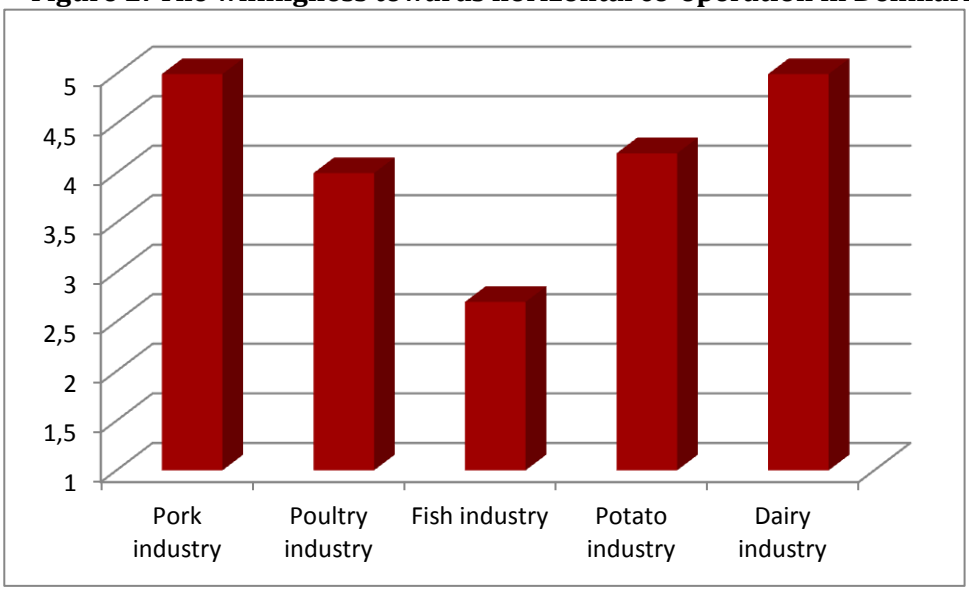
Southern Denmark, DENMARK

Similar to the findings from Scotland, the companies in the fish industry show the least willingness towards horizontal collaboration (see figure 2). The companies in the dairy and pork industries show the greatest willingness towards horizontal collaboration. Both the companies in the poultry and potato industry are also very open towards horizontal collaboration. Several of the companies interviewed had prior positive experience with horizontal collaboration.

In general, the most frequently mentioned internal motives for logistic collaboration are efficiency and costs. Actually, all the interviewed companies agree on this being the most important internal driver for horizontal co-operation. Secondly, effectiveness or service is mentioned. All of the interviewed companies are more concerned about service than sustainability. Sustainability is still considered the "good story". It is mainly a 'nice-to-have', thus marketing opportunity and PR for the companies.

The most mentioned critical success factors are openness and trust. In order for a collaboration to succeed, it is considered essential that all companies in the collaboration are equal and that companies are willing to commit themselves co-operatively.

Figure 2: The willingness towards horizontal co-operation in Denmark



The fish industry is particular under extremely strict time requirements, and transit time requirements are very critical. Frequency is also perceived as a pitfall, e.g. if a company should join a horizontal collaboration regarding shiploads from Esbjerg, Denmark towards England, more frequent departures are required. Industries in strong competition, like the fish industry, might lack trust and be sceptical towards collaboration. Finally, load sharing in trucks is always a challenge due to temperature requirements, food control, smell damage etc.

West Flanders, BELGIUM

Except with direct competitors, there is an openness and great willingness to collaborate, especially in horizontal collaboration the focus is on the development of intermodal transport corridors. Companies are interested in multimodal solutions, but do not know how to tackle this.

There has been a mental shift from door-to-door road haulage towards intermodal corridors (rail-road, inland navigation – road, short sea shipping – road). However, the role of the POM as a neutral match maker is appreciated.

The most cited collaboration possibilities are: bundling of freight flows – inbound; bundling of freight flows – outbound, multimodality (modal shift), consolidation of distribution/warehouse, reverse logistics, and supporting services (express or parcel services.)

There are six mentioned critical success factors. The first and most critical factor is without any doubt volume and horizontal collaboration is the key for gathering these volumes. Secondly, as collaboration is a people business, trust is also considered essential. Thirdly, there is a need for a

mental shift in attitude that intermodality can be as good as traditional road transportation, especially with respect to service, costs, and sustainability. Fourthly, there is a need for 'Early believers' who want to 'jump' and also a need for commitment among major community members, and finally, the need for an appropriate logistics provider to be selected who has an openness towards the community of shippers.

The rationale for collaboration is as follows: development of a stable and sustainable logistics solution; guarantee of transport capacity with intermodal trips; guarantee of stable transport prices on at least a yearly basis; and acquiring knowledge from the shipping community on operations, tactics and strategy.

The perceived pitfalls in collaboration are: cheap road transportation prices due to the economic crisis (not stable on the long term –long term versus short term vision); focus on last minute, best offers from transport companies in back haul; lack of transparency; hidden costs of current processes not taken into account; lack of reasonable profit-sharing (and other) agreements between major and smaller community members, and lack of trust, belief, commitment.

Nordmøre & Romsdal, NORWAY

During the last years there has been a better climate for collaboration between fish farming companies concerning new transport options. However, there is some scepticism connected to a sea transport solution, but there are now contacts with shipping companies and road hauliers that could make the situation a little bit more positive and prosperous due to the possibility of lowering the freight costs by introducing a sea transport connection.

Västra Götaland, SWEDEN

In general, the companies interviewed in Sweden were positive and interested in sharing knowledge with e.g. other food producers, retailers, suppliers, customers as well as carriers. They were also positive towards learning from other sub-projects within the Food Port project.

The Swedish companies that have been interviewed have all been keen to find more environmental friendly transportation solutions. However, the solutions must not have a higher cost or a reduced transportation quality in terms of for example time and reliability.

The success factors are considered to be: cost, time, flexible suppliers or customers at the other end of the transport chain, and that the company is interested in finding better solutions.

The perceived discussed pitfalls were related to intermodal and RORO solutions. First, for a new intermodal solution to work, it must fulfil the demand of cost and time, as well as having a company prepared to change their current transportation solution. To get all of these in place at the same time can be a challenge. Secondly, for implementing sea transportation solutions in the NSR, RORO solutions are often proposed. However it should not be assumed that RORO solutions are always better than road solutions.

Bremerhaven, GERMANY

Companies from all of the sectors of the seafood value chain work closely together. The key to Bremerhaven's successful operation of the fish industry is a close co-operation between logistics service providers and other actors such as processors of fish specialist food products (including the delivery of spices and additives), wholesale trade, storage and waste disposal, to name only some of them.

All in all, there is a tight network and close collaboration on the vertical level between suppliers and business partners that has been built up over many years. On the other hand, in terms of horizontal collaboration, there seems to be high competition between shippers transporting fresh fish products, and the improvement of horizontal collaboration opportunities in the fresh fish market is limited. The existing market structure seems to support market entrances in terms of vertical collaboration and to restrict the number of shippers because of the high competition.

In terms of potential bundling opportunities, the bundling of different fish products (fresh and frozen) has already taken place and in regard to the usage of different boxes are being investigated and will be further explained in the fish and seafood case of the Food Port project.

The following pitfalls were mentioned. The fish industry is influenced by seasonal demand (e.g. Christmas, Carnival), ecological changes (e.g. weather, levels of fish stocks), and consumer behaviour (eco-labelling). The fresh fish market seems to be highly competitive.

Yorkshire & Humber, ENGLAND, UK

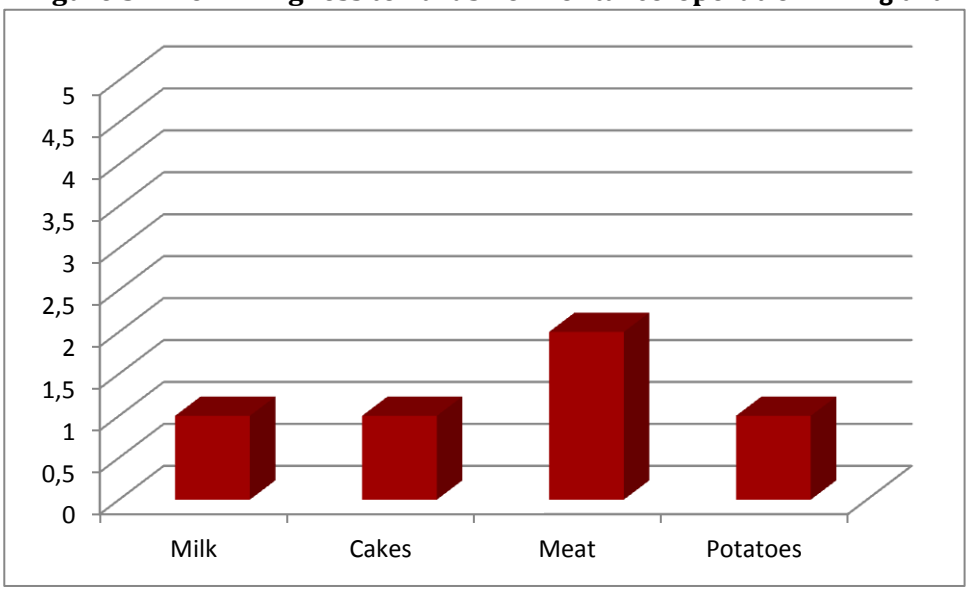
It proved extremely difficult to get companies to agree to be interviewed. For example of the three companies who operate both in Denmark and in the UK and were interviewed in Denmark, two declined in UK and one passed the enquiry around internally until it was too late. Therefore the companies actually interviewed do not represent the food flow picture across the region. In addition to the four sectors mentioned, the Humber region has a very significant seafood sector as well as cereals and oils. The flows for these sectors are described in detail in the WP 5.1 report and do not need to be re-iterated here.

The companies interviewed all indicated very limited interest (or no interest) in horizontal collaboration. They all operate in highly competitive and well established markets and either operate their own transport chains (e.g. Milk and potatoes) or use trusted 3PLs in the context of a large parent company.

A visit was also made to a major chilled food distribution centre operated on behalf of one of the UK's leading food retailers, where it was found that there are some opportunities for horizontal collaboration at what might be regarded as the top level of retailers, in terms of warehousing and transport to retail outlets, but this would be done on a case-by-case basis, led by the 3PLs rather than the retailers themselves. The retailers are increasingly outsourcing these activities in the interests of cost saving.

Outsourcing also extends to other areas, for example it was found that the potato processor now has responsibility not only to pack, brand and price goods for the retailer but also to supermarket (branch)-pick the products into roll cages that can then be added straight to the numbered branch lines in the distribution centre (which is itself outsourced to a 3PL). This further passes cost away from the retailer towards the supplier.

Figure 3: The willingness towards horizontal co-operation in England



A very recent report[44] suggests that "distribution, transport, accommodation and food" represents 21% of the total gross added value (GVA) of £14 Billion (2009) for the Humber sub-region which pro-rata would account for about 80,000 employees.

There are almost certainly opportunities within the Humber regional food sector, for further freight consolidation and horizontal collaboration. However, not enough interviews could be carried out to collect sufficient, qualitative information on food products flows to (inbound) and from (outbound) the region. Therefore, no further opportunities on freight consolidation and horizontal collaboration could be identified in the region. The reason for that is twofold. On one hand, the University of Hull was the only partner from England after the withdrawal from South Holland District Council from the project (autumn 2010). Initially, South Holland District Council would have been strongly involved in this activity and the University of Hull to less extent. On the other hand, this kind of market survey does not fit with the core activities of the University of Hull Logistics Institute and therefore, they tried to collaborate with Yorkshire Forward. Yorkshire Forward was the regional development agency (RDA) for the Yorkshire and the Humber region of the United Kingdom. However, following the public spending review announced in 2010, Yorkshire Forward was abolished in March 2012. This combination of external factors and the lack of internal resources to get in depth involvement in this activity, resulted in too few interviews, and not sufficient data on inbound/outbound flows and collaboration opportunities.

5 THE IDENTIFICATION OF GREEN TRANSPORT CORRIDORS FOR FOOD PRODUCTS

[4] "The Humber's Future Economic and Sustainable Development", White paper containing the final report of the research project, February 2013, David B Grant (Editor)

Several possibilities for transport consolidation to and from partner countries are identified from the general inter- and intra-regional food products flows analysis. Based on the geographic but also other business opportunities, three main groups of potential project ideas are identified. The first group of project ideas is related to the Scottish food and drink flows, and to the flows of frozen vegetables and potatoes from Belgium. The second group of project ideas is highly related to the Norwegian fish producers and the fish flows to and from Denmark, Belgium, and Germany. The third group of project ideas is focusing on the Belgian – Scandinavian corridor.

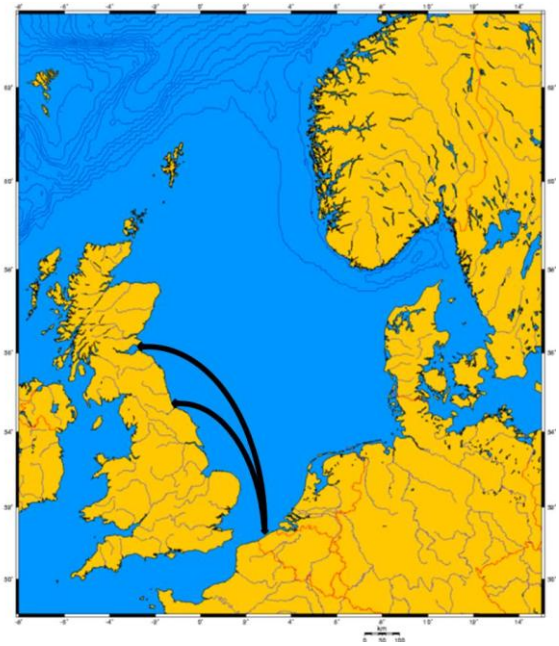
GROUP I OF PROJECT IDEAS

SCOTLAND – > BELGIUM

The further utilisation of Rosyth – Zeebrugge ferry services:

It has been evidenced by a number of current users that the Rosyth – Zeebrugge ferry service does offer efficiency and cost advantage over the alternative road connections between Scotland and continental Europe. However, unfortunately, it is not feasible for the time-dependent fish exports due to its later arrival, longer transit time and lack of frequency. Any improvement of in these factors will be appreciated by the increased interest from both food exporter and importers. Obviously, logistics collaboration would be a key tool in enhancing the usage of Rosyth – Zeebrugge ferry service in future – see figure 4.

Figure 4: Group I



BELGIUM – > SCOTLAND AND ENGLAND

Suppliers' platform towards UK for LTL-loads (groupage) with respect to frozen vegetables and potatoes (see figure 4):

- Focusing on the whole area above London (Middlesbrough, Manchester, Glasgow and Edinburgh)
- London is excluded because the road haulage prices are too low in comparison with intermodal prices;
- Everything above London can be worked out in a competitive way by intermodal transportation from the Zeebrugge area.

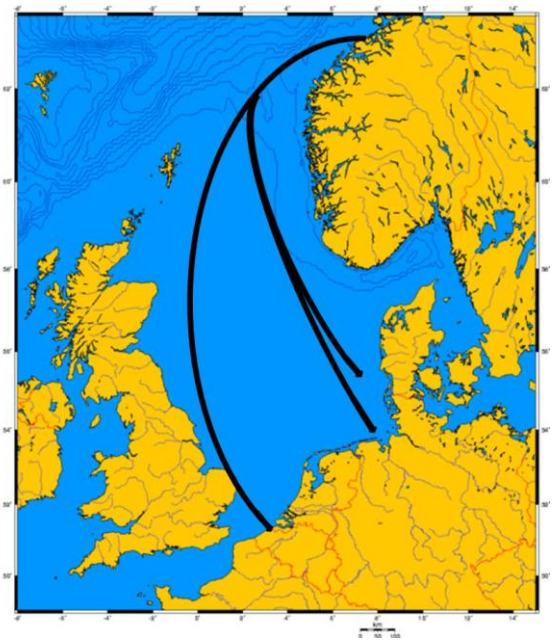
GROUP II OF PROJECT IDEAS

NORWAY -> BELGIUM

The New Fish corridor Mid Norway – Zeebrugge (see figure 5)

- Critical success factor: balancing import (fish) – export (vegetables and potatoes) flows. This is feasible thanks to the export flows of frozen vegetables, potatoes and convenience from West-Flanders towards Scandinavian countries;
- Involving Port of Risavika (Stavanger) on the return leg is suggested;
- Growing importance of "refreshing". Thanks to this new 'trend', frozen products can create (much) more added value for customers than before. The in-depth logistics knowledge of WestFlanders with respect to frozen food products, and the available warehouse capacity, is therefore a plus.

Figure 5: Group II



NORWAY -> DENMARK

Short Sea shipping between Norway and Denmark

The fish industry could collaborate on the import of fish, particular fish from Norway. Further, it is possible to export fish flour from Denmark to Norway (se figure 5).

NORWAY -> GERMANY

Short Sea shipping between Norway and Germany

A potential project regarding collaboration opportunities for the transportation of fresh fish from Norway to Germany (see figure 5).

In sum, a horizontal collaboration between fish farming companies with intermodal road-sea possibilities from Hitra, Norway via Esbjerg, Denmark to the port of Bremerhaven, Germany. In other words, fish export from Norway for delivery in Esbjerg towards Bremerhaven. From Esbjerg backloads of fish flour to Norway could be of interest.

GROUP III OF PROJECT IDEAS

BELGIUM –> SCANDINAVIA

Intermodal (road-short sea shipping) corridor towards Scandinavia (Göteborg, Kristiansund, Esbjerg, Brevik). Link with potential fish flows (frozen and fresh) coming from these regions. Ports of Zeebrugge and Oostende could operate as food hubs especially towards Southern Europe.

6 THE IDENTIFICATION OF OTHER POTENTIONAL PROJECTS FOR FOOD PRODUCTS

Six other potential projects have also been identified: 1) Repositing of maritime containers to Scotland; 2) Collaborative branding: e.g. 'Finest from Belgium'; 3) Package solution for flour in Denmark; 4) Warehouse and distribution in Denmark; 5) Domestic transportation from farmers in Denmark; and 6) Technological improvements in special transport modes in Germany.

1) Reposition of maritime container to Scotland

It is well known that the container imbalance in the UK, in particular on the Anglo-Scottish route, is a big issue. Northbound imports to Scotland come mostly as 45ft pallet-wide road trailers or swap bodies as they are retail movements from NDCs in the Midlands. However the majority of Scotland's exports leave as 20ft/40ft maritime containers either through ports or on rail. As a result, shippers (mainly whisky exporters) have to add an extra repositioning charge to their total transport costs against this shortage. If, as indicated in the interviews, the retailers and whisky producers achieve a container re-use and trans-shipment system, that could save a lot of money for Scottish shippers. Investigating the operations and the market has found that there may be a solution on the horizon to improve things for Scottish shippers, but interviews also showed that it will be quite unlikely that either side will be the one to make the operational concession to the needs of the other. So there may be a role for a publicly funded container trans-shipment centre.

2) Collaborative branding: 'Finest from Belgium'

Elaborating on a collaborative and common branding strategy with a focus on SMEs. To set up common initiatives with a clear export focus. The initiative "Finest from Belgium" is a promising and attractive example of such a collaborative branding initiative. This could also be seen as a feature of a horizontal collaboration strategy.

3) Package solution for flour in Denmark

A collaboration between the fish flour, potato flour and wheat producers regarding new package solutions which can improve the logistics. Perhaps also in regard to full ship loads to the UK and Asia. This could perhaps be applied to all three industries.

4) Warehouse and distribution in Denmark

Companies not dependent on transit time are interested the consolidation of distribution and warehouse e.g. canned petfood in Padborg.

5) Domestic transportation from farmers in Denmark

The food producing companies which are served by farmers are interested in bundling the domestic transportation of their commodities (such as milk, meat, poultry, and potatoes).

6) Technological improvements in special transport modes in Germany

A potential project regarding collaboration opportunities could be on technological improvements such as special transport systems. Further, more collaboration arrangements between actors among the project food cluster regions will be investigated in the fish and seafood case study.

7 CONCLUSION

This report summarises the "Inter- and Intra-Regional Food Products Flows" as the second step to enhance market knowledge of the food supply chain in the North Sea Region (activity 5.2) under the work package 5 (Enhancing market knowledge) of the Interreg IVB NSR Food Port project. The Inter- and Intra-regional Food Products Flows analysis includes of the following regions:

- South East of Scotland, Scotland, UK
- West Flanders, Belgium
- Västra Götaland, Sweden
- Møre & Romsdal County (incl. Nordmøre and KNH region), Norway
- Southern Denmark, Denmark
- Bremerhaven, Germany
- Yorkshire & Humber, England, UK

In sum, three major groups of potential projects were identified as green (both environmental-friendly and price competitive) transport corridors for food products: Group I: Scotland <-> Belgium <-> Denmark, GROUP II: Norway <-> Denmark <->Germany <->Belgium, and GROUP III: Belgium <-> Scandinavia. Furthermore, through the flow analysis six other potential projects were identified in the project: 1) Repositioning of maritime containers to Scotland; 2) Collaborative branding: Such as 'Finest from Belgium'; 3) Packaging solution for flour in Denmark; 4) Warehousing and distribution in Denmark; 5) Domestic transportation from farmers in Denmark; and 6) Technological improvements in special transport systems in Germany.

The general attitude towards collaboration in the partner counties is open and there is willingness to co-operate. There is also an interest in intermodal transport through bundling, and in stable and sustainable logistics solutions. Finally, there is a need for a mental shift in attitude to vertical and horizontal collaboration in logistics.

The most cited perceived opportunities are the bundling of freight flows – outbound more than inbound, multimodality (modal shift) and consolidation of distribution through platforms (in the regions of origin and/or destination). The critical success factors are volume, trust & openness, mental shift, a need for 'Early Believers' among shippers and logistics providers, commitment and step-by-step approach bringing partners together. The motivation for collaboration is mainly to save costs but also to achieve efficiency and service improvements. Sustainable logistics solutions are considered as a "nice-to-have" and "a good story". There is also a desire for a common learning and for a guarantee of multimodal transport capacity. The main motivation for companies to co-operate however, remains cost reduction!