



# Transnational Action Plan



## Colophon

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## Acknowledgment

This transnational action plan is the result of a joint effort. It is the synthesis of the work done in the various regions, which resulted in regional action plans for food logistic cluster management in the regions of Västra Götaland, Bremerhaven, Scotland, West Flanders and Kristiansund & Nordmøre Region.

This document gives the reader an overview of the general ideas, conclusions, recommendations and actions generated by the Food Port Project. This document can be used as a kind of manual. For more specific and detailed information about a particular Work Package or a specific pilot, corridor, cluster or hub, the reference list at the end of this plan helps to find the relevant document(s).

## Lead partner



## The Food Port Partners



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## Introduction to the project

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 performing food cluster and hub in Europe for food products delivered via efficient and sustainable transport systems i.e. “green transport corridors”.

Within this project different regions with an ambition in agro-food processing and distribution are brought together, have shared ideas and have set up pilots, corridors, feasibility studies between and beyond the clusters. The overall common goal is to become a top region for food.

## Introduction to the North Sea Region

The North Sea Region (NSR) includes (parts of) the following countries: Belgium, Denmark, Germany, Norway, Sweden, The Netherlands and United Kingdom.

The NSR countries represent a total population of 191 million, a total agriculture land of 42 million hectares and a ratio of agro-food GVA (Gross Value Added) between 1.8% and 4.3%.

Food production in the NSR countries represents one third of the total food production of the European Union; 300 million tonnes on a total of 893 million tonnes.

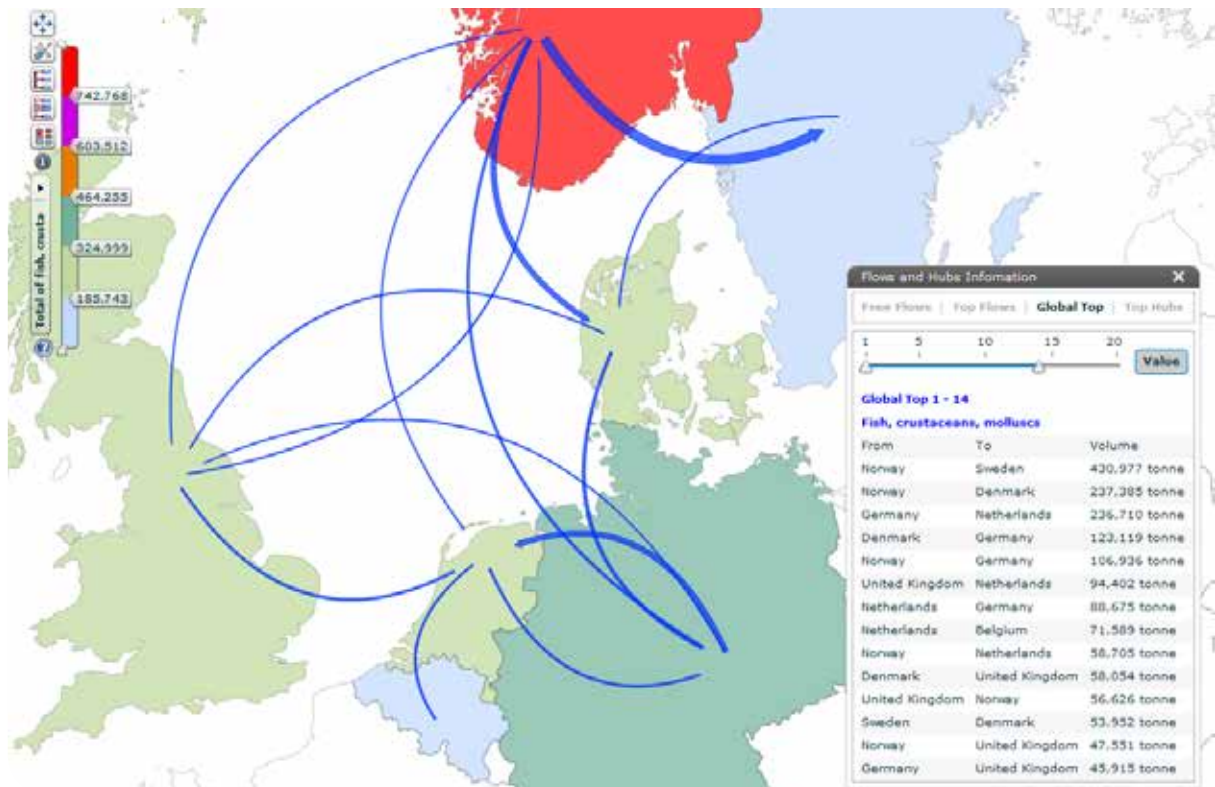
The food production generates substantial trade flows. The yearly trade flows between NSR areas amount 70 million tonnes (2010). The table below gives an overview of the trade flows (in million tonnes) in the various SITC (Standard International Trade Classification) categories.

Food type	Trade Volume	Food type	Trade Volume
SITC-00 live animals	1,6	SITC-06 sugar, salt and honey	2,8
SITC-01 meat	4,0	SITC-07 coffee, tea, cocoa, etc.	1,5
SITC-02 dairy and birds' eggs	5,9	SITC-08 animal foods	13,3
SITC-03 fish	2,1	SITC-09 miscellaneous edibles	2,6
SITC-04 cereals	13,2	SITC-11 beverages	8,8
SITC-05 vegetables and fruits	13,9	SITC-12 tobacco	0,1

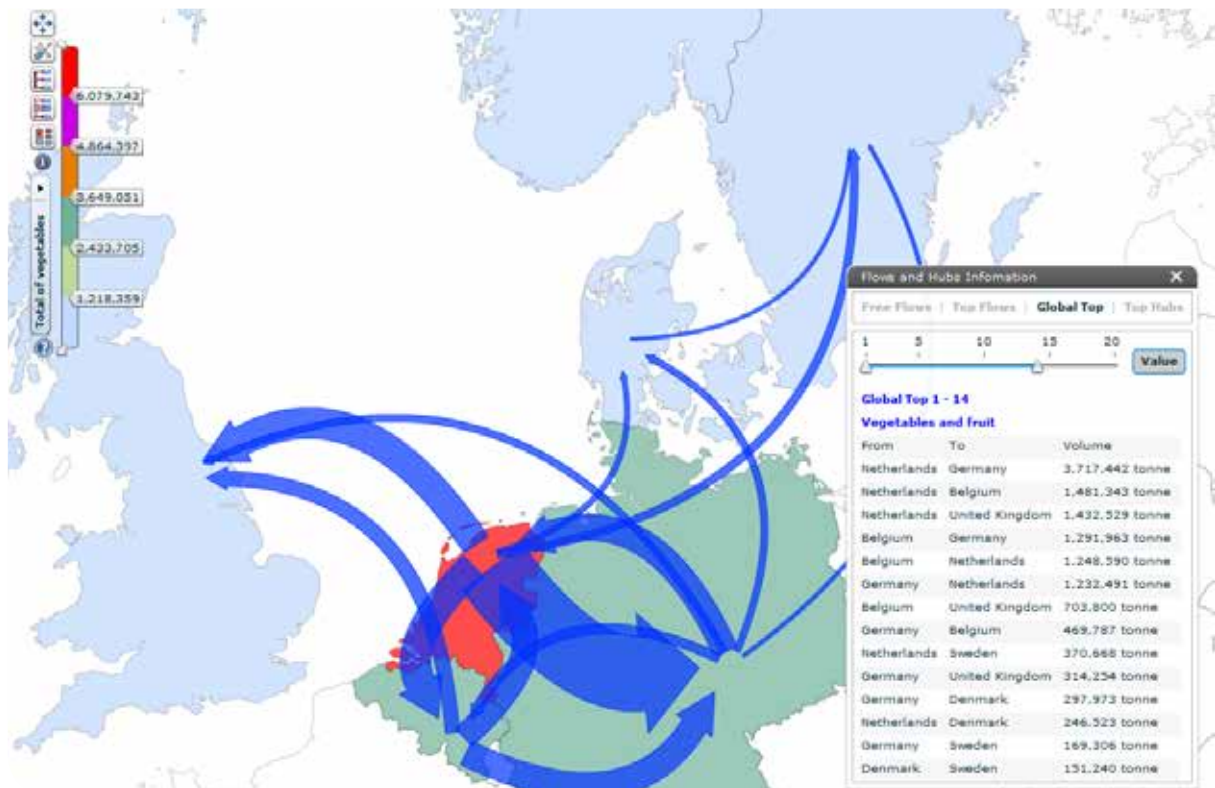
In order to get an idea of the trade flows in the schemes below the various flows are presented for the two most relevant SITC categories: “fish and fish products” and “vegetables and fruits”.

As can be seen on the following maps, The Netherlands is an important country for food trade. Unfortunately, the Food Port Project had no partners in The Netherlands.

### SITC 3: fish and fish products



### SITC 5: vegetables and fruits

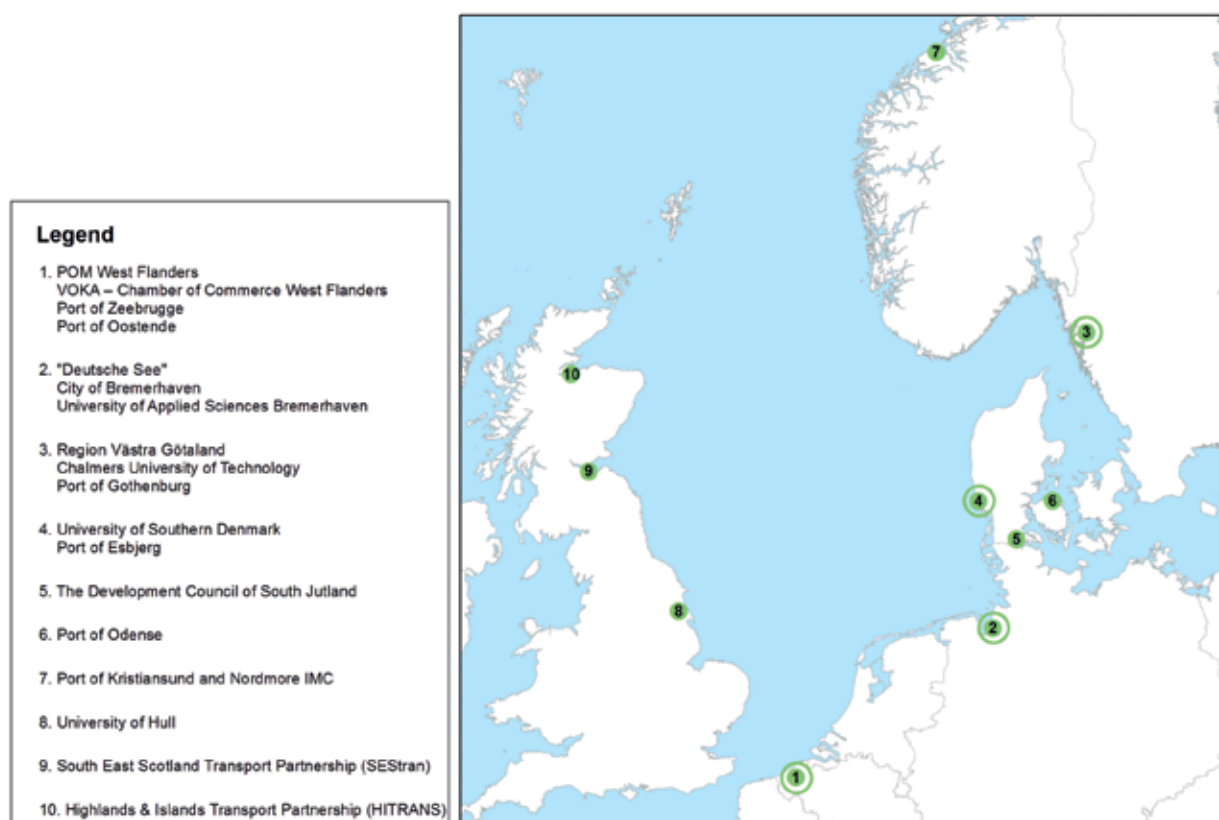




The North Sea Region Programme Area

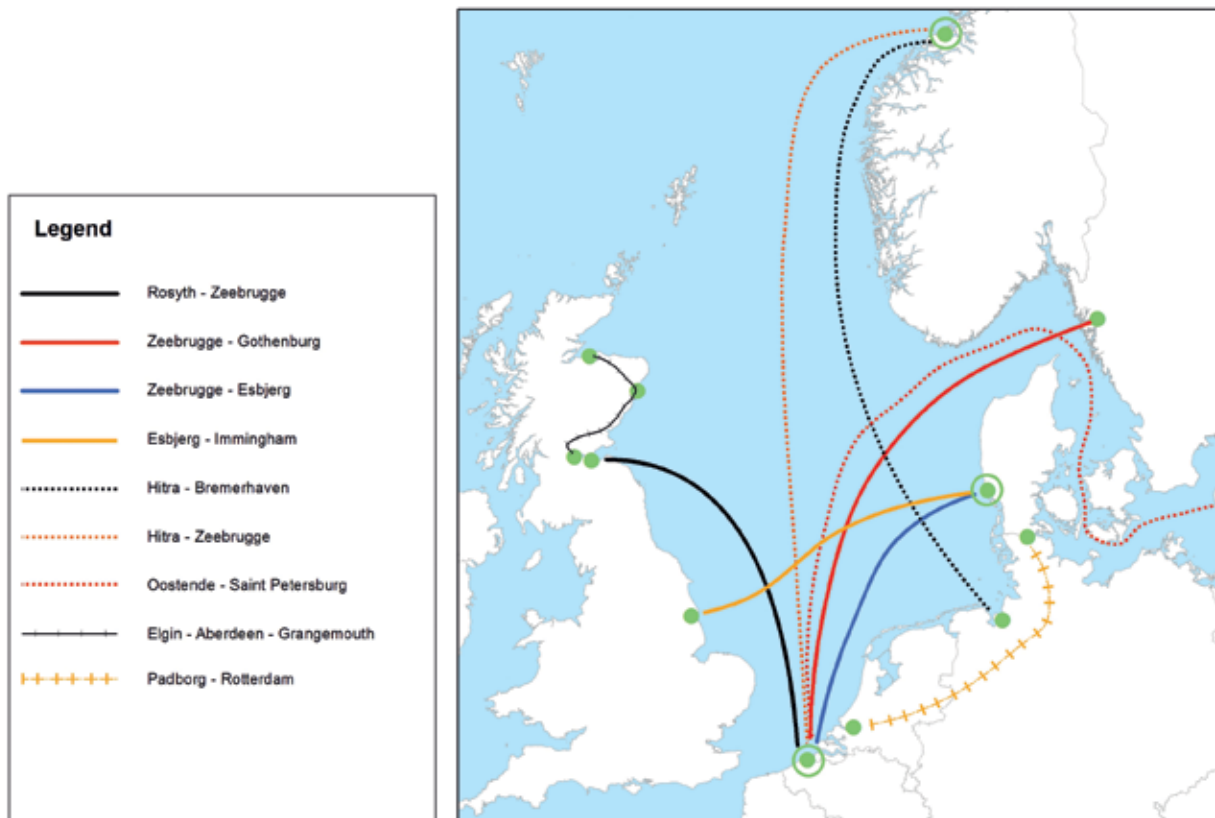
### Partners in the Food Port Project

In the map below the Partners in the Food Port Project are visualized.





The following map indicates the existing and potential (sea and/or rail) corridors between the different Food Port regions. The partners in the project have collaborated to strengthen or establish these corridors.



## Challenges to overcome

Given the ambition to be the best food cluster and hub in Europe for food products, the Food Port Project has identified several challenges to overcome. In the following areas major improvements are required to achieve this ambition:

- Integration of a fragmented agro-food and logistics market;
- Efficiency in transport and logistics;
- Multimodality;
- Quality of logistics services;
- Internalization of external effects (costs) in transport and logistics;
- Dealing with the increase in congestion – transport capacity limitations;
- Clustering and bundling;
- Collaboration and coordination among various stakeholders.

## Actions and policy recommendations for agro-food industries in the North Sea Region

In this transnational action plan **actions and policy recommendations are defined** to strengthen and to anchor agro-food industries in the various regions. Both within and between clusters or hubs there is a constant 'symbiosis' of on one hand competition and on the other hand collaboration. Especially the collaboration part still needs to be further explored and facilitated. In this action plan **collaboration** in various forms and on different levels is **the central theme**.

## A balanced exercise

A basic principle stated within the Food Port Project is the continuous search for balances. Also this transnational action plan is the result of a balanced exercise. Various balances are distinguished.

- **Public** steering versus **private** initiative balance  
For both public and private actors a specific and distinct role and responsibility are defined. In some cases it could be more the public sector and in other cases rather the private sector who might take the lead. Anyway actions to be undertaken are always to some extent the result of a public-private collaboration.
- **Generic** versus region **specific** balance  
The synthesis of a European project, like Food Port, needs to be generic, i.e. relevant for the different (partner) regions, but also to some extent specific in order to avoid a vague and meaningless plan, far away from practice in the various regions. That's why a modular approach is used. Action boxes are designed as building blocks. Each region or actor has to decide which particular set of blocks is needed to strengthen or to anchor its or one's own food cluster and/or hub.
- **Lean** and **green** balance  
Food Port is focusing on so-called green corridors and sustainable logistics and transport solutions for food supply chains. However sustainability (in ecological terms) is not the only objective to evaluate new logistics solutions. Beside sustainability, also cost-efficiency is an important evaluation parameter. Innovative logistics solutions need to be both lean (cost-efficient) and green.
- **Food** and **Port** balance  
In the Food Port Project a permanent balance between on one hand the food sector generating food flows and on the other hand the transport and logistics (port) sector supporting this industry had to be overlooked. For some actors the stress is on the food business, for others the stress is on food logistics. Anyhow food and logistics brought diverse parties together.







In the Food Port Project a clear distinction is made between clusters and hubs. Connections between both clusters and/or hubs are provided through corridors. These three main components (clusters, hubs and corridors) form the Food Port system. Within the project, we have defined these components as follows:

### Cluster

A cluster, also called an industrial district, is a geographic location or region in which a group of companies and other entities (such as knowledge institutions) within a given profession are located together. A familiar example of a cluster is Silicon Valley in California.

The cluster concept was developed by Michael Porter and is described in his book “The Competitive Advantage of Nations”<sup>1</sup>. Because in a certain area, which may be as large as a city, a region or a group of countries, a certain group of companies is established, there is added value for other companies to settle in this area. This is because they use the same suppliers and the same customers within a certain area. These are so-called external economic advantages. Also, some businesses benefit from the employees in an area having a specific knowledge which is relevant for these companies. Because these workers occasionally change employer, this creates a dynamic for innovation. Porter mentions in his book many other benefits, that also exist for agglomerations. A cluster can thus build up a huge lead over other regions, to become a world leader in a particular specialist area. These cluster features are confirmed in the book “Logistics Cluster” from Yossi Sheffi.<sup>2</sup>

A cluster should be at least **a concentration of activities with a common logistics need** as a main feature. A concentration that results in economies of scope and scale.

A cluster as defined in the Food Port Project is characterized by the following dimensions:

- Geographic scope – the cluster region;
- Sector scope – the cluster niche;
- Proximity and concentration of similar and/or complementary activities creating both competition and collaboration opportunities;
- Economies of scale and scope;
- Common logistics requirements – hub function supporting the food cluster, both for inbound and outbound flows.

The last dimension – the logistics – distinguishes the clusters in the Food Port Project from other clusters. Here we are dealing with food logistics clusters.



## Hub

An abundance of definitions exists for a hub. In the Food Port Project a hub is defined as a central location to which freight flows from many regions are directed and from which freight flows are fed to other areas. A hub is the central node in a so-called hub-and-spoke system.

Connectivity, preferably multimodal, is certainly a key feature of a hub. Infrastructure and logistics capacity are critical success factors. In contrast to the definition of a cluster, the point of view here is mainly from the logistics supply side. Co-modality and 'synchro-modality' are terms used to express the connectivity through different transport modes.

This hub function can be incorporated in a gateway (e.g. seaport) or can be part of a so-called Extended Gateway in the hinterland.



Port of Esbjerg

## Corridor

Corridors are characterised by a connection between a region of origin and a region of destination. In the ideal situation a balance of flows in both directions is obtained. In the framework of Food Port, a green corridor is considered in a broad way. In terms of "sustainability" it combines on the 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 environmentally friendly, but not price competitive, will not be sustainable and could not be developed on a structural basis.

"Cluster", "hub" and "corridor" are called the primary Food Port system components. To support these key components one has a middle "Orgware" layer and on top of this a "Innoware" level (see further, chapter 5).



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This action plan is a compilation of results generated by the Food Port Project. This plan offers a holistic perception of on the one hand future perspectives for agro-food & logistics and on the other hand actions needed to strengthen both the North Sea Region as a food region as a whole and the individual food sub-regions.

The goal of this action plan is to provide a comprehensive picture of the hot topics in the field of food and food logistics. The plan is intended to act as an inspiration and to contribute to discussions on future policies on a European, national and regional level. It fits also in the EU cohesion action programmes.

The authors have opted for a modular approach. Building blocks are provided in various action boxes. Given their specific needs, regions are able to stress more or less on a particular action box.

The **central goal** -one might call it the mission- of the action plan is **to strengthen the agro-food industry** in Europe, and more specifically in the North Sea Region. To strengthen means in the first place to facilitate and to support the food related activities within clusters and to create extra chances through a better connectivity with both source (production) regions and consumption (attraction) regions. Connections and collaborations with 'colleague' or complementary clusters might also strengthen a cluster. Connectivity is obtained through appropriate hubs and adequate multimodal corridors.

The ambition to cooperate is a central objective of the Food Port Project, cooperation or collaboration both in a vertical (within the supply chain) and a horizontal way (cross supply chain).

Food Port is conceived as a 'positive forward looking' project. One is searching for opportunities, rather than to get stuck on threats and pitfalls. The action plan presented here is the result of this positive, opportunity-driven attitude.

The following chapters in the paper represent **two main parts**. First the challenges and **perspectives for the future** in agro-food & logistics are described (chapter 4). This glance at the future is based on the synthesis of the lessons learned collected in the various initiatives, projects, tests, modelling exercises,... taken or executed by the various partners in the Food Port Project. These perspectives for the future are followed by concrete actions structured in different action boxes. Together they form an **integrated action plan** for the North Sea Region in order to strengthen the agro-food industry using logistics as distinct lever.



There are various challenges to cope with in the agro-food industry and logistics. The above considered components of the 'food port' system, namely food clusters, hubs, corridors, operate in a broader context. That is why in this chapter a perspective for the future in agro-food & transport-logistics is outlined given the current context, the relevant trends and plausible scenarios,... The future perspectives could be very broad, nevertheless we have tried to order them around a core theme: "fairness". Both private and public actors are striving respectively for fair transport, fair trade and fair food. It is obvious that these different shapes of fairness are interrelated and linked. The particular meaning of fairness in the three domains, transport, trade and food, is described below.

The sequence -transport, trade and food- could be reversed. The authors have chosen the transport, trade, food order for the reason that in the Food Port Project both study and project processes often proceeded in this way: starting with developing transport solutions, then integrating them within a total logistics process and finally optimizing the total life cycle of the handled food products.

This chapter can be considered as the vision on food logistics developed by the Food Port partners.

### Fair transport

One of the objectives of EU transport policy is creating or facilitating a so-called '*level playing field*' across the various transport modes. This means in the first place a **fair pricing** with a correct internalisation of externalities (i.e. costs which are not paid by the transport user). In case of a full internalisation ("Environment" Scenario, Cfr. Work Package 5.4 of the Food Port Project - Scenario Analysis) transport will become substantially more expensive. A doubling of transport costs will definitely influence transport choices. From an environmental point of view, i.e. internalisation of externalities, this doubling of transport costs might make sense. Today, this seems politically not realistic.

In the "Regulation" Scenario which could rather be considered as business-as-usual, only limited carbon taxes or other road pricing systems are implemented, with limited impact on the demand for transport and transport decisions. In the latter scenario transport becomes more and more (or stays) a commodity which can be easily bought in a price-competitive market. Transport users (shippers, forwarders, logistics providers,...) are insufficiently triggered to optimize their transport. In this scenario no breakthroughs in transport on a short term could be expected, except when in some crowded (urban) areas congestion really becomes a substantial problem.

Another target of EU transport policy is a more **sustainable transport** through e.g. an optimised use of energy. In 2050 no more 'conventionally-fuelled' vehicles are allowed in urban areas. One needs to reach a 30% modal shift in 2030 and 50% modal shift in 2050 for freight transport above 300 km. In terms of CO<sub>2</sub> a decrease of 60% CO<sub>2</sub> eq. in the period 1990 – 2050 is targeted. On the other hand the EU Commission confirms that transport is vital for economic progress and that an expected transport demand increase of 80% by 2050 is considered.







These targets can only be reached by means of a disruptive new approach of transport. Through clustering and bundling one can help to realize this breakthrough. Today transport is often too cheap and too much considered as commodity to trigger market actors to resolutely go for a structural bundling of their freight flows.

Bundling of volumes on “synchro-modal” corridors is one objective. The EU at least has the intention to set up a consistent and integrated policy towards corridor transport. Europe builds a core network connecting nodes with well-performing industrial clusters and logistics hubs. Beside that core network, a comprehensive transport network needs to provide connectivity on a more regional level. In this way corridors appear with multimodal, efficient, green, safe and secure lanes. The food clusters and related (logistics) hubs developed in respectively WP 5.3 & WP 3.2 of the Food Port Project need to be connected on the EU comprehensive transport network and preferably directly on the core network.

On these corridors the efficiency and sustainability of transport could be improved substantially and simultaneously. Through bundling transport can be made more efficient. Transport equipment is utilised in a better way.

Through balancing of transport flows empty haulage is avoided. Through pooling of returnable transport items (RTIs, cfr. WP 4.2 of the Food Port Project) one can even optimise equipment better.

Through bundling of freight flows into dense volumes on these transport corridors a modal shift to alternative transport modes becomes more feasible. Corridors become multimodal transport lanes with both “co-modal” and “synchro-modal” opportunities. That makes transport corridors sustainable in a broad sense.

The required level playing field needs also to be assured in the field of environmental legislation. The new so-called **sulphur directive (Directive 2012/33/EU)** defines stricter sulphur limits for marine fuel in SECAs (sulphur emission control areas) (1,00 % as of 1 July 2010 and 0,10 % as of 1 January 2015) as well as in sea areas outside SECAs (3,50 % as of 1 January 2012 and, in principle, 0,50 % as of 1 January 2020). The Baltic Sea, the North Sea and the English Channel are designated as sulphur emission control areas (SECAs). The food clusters in The North Sea Region will suffer extra from this directive, because short sea shipping is crucial for connecting the various food clusters. This seems not to be a fair transport situation.

Heavy goods vehicles transporting goods in Europe must comply with certain rules on weights and dimensions for road safety reasons and to avoid damages to roads, bridges and tunnels. **Directive 96/53/EC** sets maximum common measures, ensuring a fair competition among road hauliers in the European Union. However these maximum common measures differ from state to state. Especially the debate on longer and heavier vehicles for road freight transport (abbreviated as LHV; length up to 25.25 m and weight up to 60 tons), illustrates a fundamental lack of an integrated transport policy on the European Commission level. Such trucks are already in circulation in Finland and Sweden, while several Member States are exploring the opportunities and threats separately. Also in road transport a level playing field or a fair transport market in the EU is missing.

## Fair trade

One continuously needs to search for smarter solutions in logistics. These solutions are often situated on a strategic level, **optimizing the total supply chain**. Transport systems (cfr. above, "Fair Transport") are part of a broader solution, which is one optimizing logistics processes or even covering supply chains as a whole.

Here freight flows are considered. The principle of fair trade is the key perspective.

Besides a **total logistics or supply chain cost calculation** also a total carbon footprint calculation needs to be made. As mentioned above, as long as the carbon footprint, by means of a *carbon tax* is not internalised in the transport cost, one should not try to monetize this 'effect'.

The total logistics cost approach is a common approach to evaluate transport alternatives combining transport, inventory and handling costs. All costs are added up into a so-called total logistics cost. The following cost components are considered.

## Total logistics cost

**Transport cost:** the full cost to carry out the transfer of the goods from point of origin A to point of destination B, with A the supplier site and B the point of destination (client's site).

**Transport time cost:** generalised cost which is the translation of the value of the time the goods are on the road. The faster the transport, the smaller the transport time cost will be.

**Holding cost:** cost to hold the goods in stock or inventory. This inventory is due to the fact that the goods are delivered at discrete times in order packages Q, while the demand is (more) regularly spread over the whole time cycle.

One also needs to hold inventory in order to cope with uncertainty (e.g. in client's demand, in lead time). The safety stock is defined as the average level of the net stock just before a replenishment arrives. Safety stocks can be seen as a cushion against stock outs due to fluctuations in demand, supply and lead time. The higher the safety stock is, the smaller the chance to have stock outs and the higher the service level will be.

**Handling cost:** cost to handle goods (packing and unpacking, loading and unloading, storing and picking of goods). The total handling cost is dependent on the volume of the (incoming and outgoing) goods flow (e.g. the annual demand). Sometimes the handling cost is influenced by the transport mode.

**Shortage cost:** shortage cost is the cost caused by the fact one is not able to deliver the goods on time. One is temporarily out of stock.

**Replenishment cost:** replenishment cost is the fixed cost component incurred with each replenishment or order, e.g., administrative costs, fixed commission wages, quality control procedure per order,...

**Inventory and transportation control cost:** periodic or continuous review of the inventory height on the one hand and the tracking and tracing of transport vehicles on the other hand, mean extra costs for the logistics firm or department. These costs are called control costs and depend on the system used to review or to track and trace. In most of the cases these costs are rather difficult to estimate and are not taken into account in logistics decision processes (hidden costs).

Besides the total logistics or supply chain cost, also **the carbon footprint** for the various actions, processes and handling needs to be calculated. In various studies it is proven that cultivation or production of food represents mostly a large part (even more than 50%) of the total carbon footprint. From a life cycle assessment point of view it might be reasonable and fair to generate a trade flow importing or exporting products from or to a region with similar food products cultivated (cfr. study Port of Gothenburg, "Locally grown tomatoes are not always the greenest"). From an environmental point of view local tomatoes in Sweden are not always preferred to the one imported from e.g. Spain. The trade flows of tomatoes (and other vegetables and fruit products) from Spain to Scandinavia might be considered as 'fair'!

A fair trade can only be assured through uniform procedures in terms of safety, security and administration. Standards in legislation and regulation are a must, in the food sector especially in the field of food safety standards.

Through Information and Communication Technology (ICT) the fairness of trade flows can be controlled. **Identification, location and communication (ILC)** are the main functionalities (cfr. WP 4). One needs to create applications providing tracking & tracing visibility along the whole supply chain, from raw materials to consumable products.

The concept of "**the internet of things**" could be applied on the food supply chains uniquely identifying all objects and virtually representing them in an Internet-like structure. Radio-frequency identification (RFID) was seen as a prerequisite for the Internet of Things in the early days. If all objects (and people) in operational life were equipped with identifiers, they could be managed and inventoried by computers. Besides using RFID, the tagging of things may be achieved through such technologies as near field communication, barcodes, QR codes and digital watermarking,...



The integration of logistics within the supply (value) chain can be improved through the "**design for logistics**" **principle**. Design for logistics is a series of concepts in the field of supply chain management involving product and design approaches that help to control logistics costs and increase customer service levels. Packaging of food products must be designed in this way that it is easy (efficient) to ship and to shelf. Structural optimization of transport and logistics starts in the design of products, processes and packaging.

Besides the well-known economies of scale and scope, one needs to explore "**economies of chain**". Economies of scale and scope are conceptually similar. Whereas economies of scale for a company primarily refers to reductions in the average cost (cost per unit) associated with increasing the scale of production or transport for a single product type, economies of scope refers to lowering the average cost for a company in producing or handling two or more products. Through integration and through an adequate supply chain design chain effects in food trade are generated.

An integrated food supply chain approach is recommended to make food trade flows fair.

## Fair food

As described above **“local-for-local” products** are not always representing the most sustainable or fair solution. In a globalizing world this *local-for-local* phenomenon might be considered as a counter-trend.

One often has to take into account the seasonality of food products. Within its season local products are often preferable. Out of season the same products should be imported from even overseas regions.



In the Food Port Project one was not dealing with the intrinsic characteristics of the various food products as such. However in WP 4.2 tests were elaborated by Deutsche See on fish products. To realize a modal shift someone must take into account that food products, especially fresh food products, have a very short shelf life. If the transport mode is changed, one has to find out new techniques that achieve a longer shelf life, so that these products reach the point of destination in the same quality as before. For these tests Deutsche See has worked with a reefer container with a special new technique which allows to adjust the humidity and gas composition. On the other hand they have made tests with big sealed crates with a modified atmosphere inside. The tests result in a slightly longer shelf life, today not enough to make a modal shift feasible in terms of product quality.

Fair food is food that is produced with a minimal total carbon footprint. Based on a **Life Cycle Assessment (LCA)** one should define this minimum carbon footprint. Life cycle assessment (LCA, also known as life-cycle analysis, eco-balance, and *cradle-to-grave* analysis) is a technique to assess environmental impacts associated with all the stages of a product's life from-cradle-to-grave (i.e. from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling). LCAs can help avoid a narrow outlook on environmental concerns by: compiling an inventory of relevant energy and material inputs and environmental releases; evaluating the potential impacts associated with identified inputs and releases and finally interpreting the results to help make a more informed decision.

Food products need a clear **labelling**. The European Union (EU) is improving the rules concerning the labelling of foodstuffs so that consumers have essential, legible, and comprehensible labelling at their disposal in order to make informed choices when buying products. For public health reasons, the new rules strengthen protection against allergens. The strengthened rules provide fair products, on the condition that those extra requirements are useful and not exaggerated.

On top of environmental issues and business economic aspects, also social (e.g. labour or work force related) requirements need to be considered. These **social issues** are often summarized in a so-called Corporate Social Responsibility (CSR) charter. Many approaches to CSR pit businesses against society, emphasizing the costs and limitations of compliance with externally imposed social and environmental standards. Creating Shared Value (CSV) acknowledges trade-offs between short-term profitability and social or environmental goals, but focuses more on the opportunities for competitive advantage from building a social value proposition into corporate strategy. CSV needs to be applied on food businesses.

From cradle-to-grave (cfr. LCA) more and more one is moving towards closed loop cycles in a so-called **regenerative economy**, i.e. *cradle-to-cradle*.

Also in agro-food it is recommendable to apply the principles of the regenerative economy in order to make food products really fair.

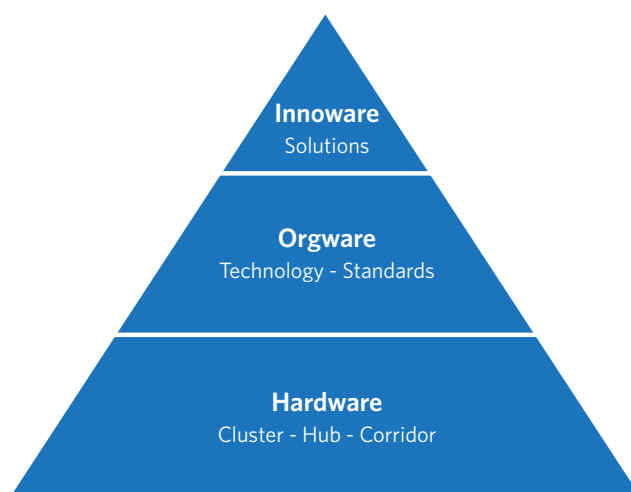


## 5 Six interrelated action boxes

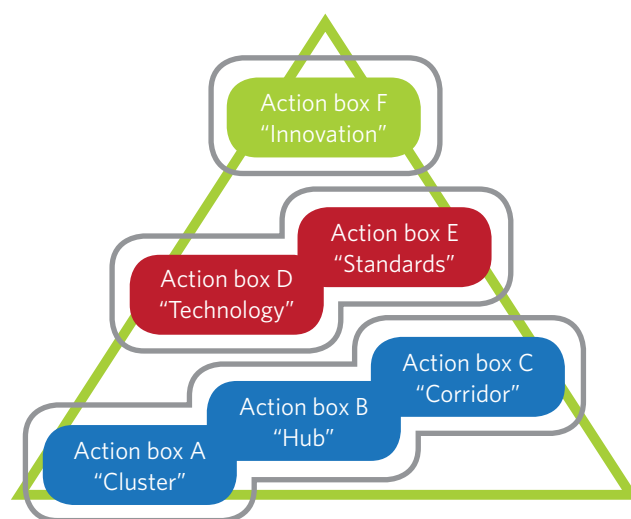
In this chapter the structuring of the various actions and recommendations is presented. The actions and recommendations are structured in different action boxes, which are introduced in this chapter.

### A structure with action boxes

A distinction has to be made between the primary Food Port system components, Cluster, Hub and Corridor and the supporting components Technology and Standards. The three primary or main components need dedicated, but mutually reinforcing actions, integrated in respective action boxes. Technology and Standards have so-called supportive action boxes. On top of this innovative solutions are elaborated, introduced and implemented. The actions necessary to make this happen are collected in a sixth action box. One could classify the various actions on different levels, respectively in a “hardware”, “orgware” and “innoware” level (see scheme below).



The various actions on related levels are classified in different action boxes, as presented in the scheme below.



The basic (blue) level is the level of the “Hardware”, enclosing the cluster (A), hub (B) and corridor (C) action boxes. Above this a level labelled “Orgware” is provided with Technology (D) and Standards (E) action boxes. On top of the latter the action box F is defined, containing Innovations on a so-named “Innoware” level.



## A fixed template for the various action boxes

The different action boxes are described in a fixed template with the following topics:

- Introduction: description of the action box (why)?
- Goal: what to achieve with the action box?
- Baseline: what is the current situation, status, context (the problem)
- Horizon: within what time horizon the goal can be achieved (when)?
- Stakeholders: who will play a role in achieving the goal?
- Actions: how can the goal be achieved (bridging the gap)?
- Policy recommendations: how can policy makers help achieving the goal; solving the problem?

The various defined actions contribute to **an overall strategy** to strengthen the agro-food industry in the North Sea Region.



In action box A actions are defined elaborating an active cluster policy focusing on the agro-food industry, covering **both food production** (agriculture, growing, breeding, fishery,...) **and food processing**. The food sector is in most of the participating regions one of the top sectors. An appropriate and adequate policy is considered as needed, but not yet in place.

Through competition and collaboration within the food cluster one can generate so-called “**Economies of chain**”. Both in vertical (within the supply chain) and in horizontal (between supply chains) sense, a combination of competition and collaboration should make the food cluster stronger.

The focus in this action box A is on creating a Unique Selling or Value Proposition (USP) for the food cluster. In clusters one should **focus on the products** processed and handled, in other words a demand side focus. Proximity and concentration of activities are here the critical success factors.

In the reference list at the end of the report an overview of the regional action plans for food logistic cluster management is given.

### Food Cluster



#### ACTION BOX A

#### Set up of an integrated cluster strategy customized to the agro-food industry

<b>Introduction</b>	Clustering and bundling is the future. The advantages and opportunities are clear. Economies of chain are obtained. Companies within a cluster are strengthened through competition and collaboration. In this way these companies are anchored. In addition this makes a cluster attractive to new activities.
<b>Goal</b>	To set up an integrated and consistent cluster strategy for the agro-food industry; to strengthen the existing cluster activities and to attract new activities and businesses.
<b>Baseline</b>	A rather accidental concentration of complementary activities in agro-food industry caused by some attractive location factors (fruitful soil, favourable climate, fishery, expertise in agro-food productivity,...).
<b>Horizon</b>	2020
<b>Stakeholders</b>	<p>National/regional/local governments. Some states invest in an active sector-focused cluster policy. The public sector is in the lead. They have the role to bring together the various stakeholders in a cluster platform.</p> <p>“Government should focus on contributions that support and nurture the development of clusters and should refrain from trying to build clusters from scratch” is a statement which emerged in the Food Port Project.</p> <p>The main actor who has to take the lead for the distinct actions defined in this action box is mentioned at action level (in parentheses) and is called the ‘action-owner’.</p>



## Actions

A.1 Elaborate an effective cluster strategy embedded in a well-defined and focused cluster policy. Define a mission and vision for the agro-food cluster (national - regional).

A.2 Set up of an agro-food cluster platform unifying the various stakeholders. Create consensus and alignment among the stakeholders about the cluster mission and vision (regional).

A.3 Facilitate and disseminate best practices in cluster collaboration (e.g. joint warehouse with shared services in logistics) (cluster organisation).

A.4 Introduce an active branding for the agro-food cluster. Promotion should be focused to both (internal) stakeholders, creating commitment – involvement – alignment – awareness, and external parties, like potential business developers and investors, customers and suppliers. Choose an attractive cluster name (cluster organisation).

A.5 Develop an appropriate infrastructure and spatial planning strategy focused on the identified (agro-food) cluster. Prioritize transport infrastructure and spatial planning initiatives facilitating cluster opportunities (national/regional).

A.6 Facilitate and coordinate knowledge and innovative initiatives in the field of agro-food. The various knowledge, innovation and competence institutions and organisations are stimulated to synchronize their research and valorisation programs and to collaborate on topics where synergies can be obtained (national/regional). This action is characterised by the following elements:

- Cluster leadership;
- Collaborative and linked;
- Industry, also small and medium-sized companies (SMEs) involved;
- Bridging the gap between industry and academic sector – focus on knowledge transfer.

A.7 Activate the labour market for the agro-food industry. Promote working in the defined cluster sectors. Make efforts in matching supply and demand in the labour market for the agro-food industry (national).

## Recommendations

The European Union should stimulate a cluster policy in the various member states and regions.

## Remarks

Shift from a rather fortuitous resulting cluster towards a pro-active and integrating cluster policy.

A cluster policy should be open and not limitative – one should be open for other and new (economic) opportunities when they arise.





In this box, we define actions focusing on logistics hubs: how can logistics hubs support and strengthen the agro-food industry?

In the Food Port Project a hub is considered to be in direct relationship to a specific food cluster.

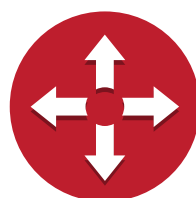
A central location and connectivity are the critical success factors for a hub. A hub-and-spoke system is connecting the hub with various other regions. These regions could have three types of relations with the region or cluster supported or strengthened by the hub. A region could be a sourcing or **production area** providing (raw or intermediate) food products to the hub's region for further processing. It could also be an **attraction area** where the products produced or processed in the hub's region are consumed. Finally, it could be a region with similar or complementary activities creating collaboration and thus synergy opportunities for both regions if they are connected by a corridor or through a cluster network.

The 'spokes' in the *hub-and-spoke* system are named corridors in our Food Port system.

Transshipment in a broad sense –changing from one transport service to another– is the basic function of a hub. On top of this physical handling or reshuffling activities, various value adding logistics and services (VAL & VAS) could be offered at the hub. In this way a hub can generate “**Economies of scope**” through an integration of services.

In the reference list at the end of the report an overview of the different action plans for the realisation of food distribution hubs is given.

## Food hub



### ACTION BOX B

### Activate logistics hubs strengthening the agro-food industry

#### Introduction

It is crucial for every activity or business to be connected both to suppliers and customers. A hub enables this connectivity on a cluster level. The food cluster needs a hub to be connected with various sourcing and consumption areas.

#### Goal

To activate a hub with appropriate functionalities both in transshipment and in value adding logistics and services (VAL & VAS) in order to strengthen and to anchor the agro-food cluster.

#### Baseline

A hub focused on rather basic logistics handlings, mainly transshipment.

#### Horizon

2025



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## Stakeholders

The following (public) actors should take the lead:

- Gateway authorities;
- Extended Gateway authorities;
- Transport infrastructure providers (road, rail, water,...).

Private companies need to be involved.

Shippers (i.e. owners of freight flows) might engage volumes in order to enable logistics providers to set up (new) transport services originating from the hub.

The public sector needs to facilitate and support the establishment of new transport lanes and hub services. In the beginning, a new service might be loss-making, therefore, a public subsidy helping to cover for the difficult start-up phase might be required. However, the newly established services (transport corridors or other hub services) should have the potential to become economically viable after a certain time. Once the new service is viable, the public actors can withdraw and no further subsidies and support are needed.

The main actor who has to take the lead for the distinct actions defined in this action box is mentioned at action level (in parentheses) and is called the 'action-owner'.

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<b>Actions</b>	<p>B.1 Set up of a logistics hub platform dedicated to the food industry. This platform integrates both transshipment and value adding logistics and services. This results in a multi-feature platform (regional authorities).</p> <p>B.2 Invest in a multimodal accessibility of the hub or platform. Multimodality will guarantee the robustness and sustainability of the transshipment system (national - regional authorities).</p> <p>B.3 Create a collaborative environment in which new collaboration opportunities for market players appear (regional authorities).</p> <p>B.4 Develop a clear branding for the food hub. Promotion should be focused to both (internal) stakeholders, creating commitment – involvement – alignment - awareness, and external parties, like potential business developers and investors, customers and suppliers. Choose an attractive hub name (hub management).</p> <p>B.5 Prioritize transport infrastructure and spatial planning initiatives within the hub focusing on agro-food and food industry (regional or national authorities).</p> <p>B.6 Be open for knowledge and innovative initiatives in the field of agro-food-logistics. Play the role of active and loyal actor in knowledge creation, dissemination and valorisation in this field (regional or national authorities).</p> <p>B.7 Support the activation of the labour market for the agro-food-logistics industry. Promote working in the field of agro-food-logistics. Support education and training programs for agro-food logistics and supply chain management (regional or national authorities).</p> <p>B.8 Create an ‘open-access’ or ‘public’ intra-hub of intra-port transport system. Such a system needs to be the outcome of a public-private cooperation (hub organisation).</p>
<b>Recommendations</b>	<p>We need a public umbrella organisation (ministry?) that covers all matters connected to logistics and transport means, modes and infrastructure.</p>
<b>Remarks</b>	<p>Shift from a passive hub function generating costs towards integrated hub services generating value.</p>

In action box C actions are brought together setting up, strengthening and controlling corridors connecting food regions. Corridors are characterised by a region of origin and a region of destination. In the ideal situation a balance in flows in both directions is obtained. Then a kind of freight flow loop is created with a region of origin which is the region of destination for the opposite flow and vice versa.

Volume is here the critical success factor. One can generate “**Economies of scale**” through bundling of flows. If that bundling is executed in a structural way one can elaborate a reliable, robust, sustainable and cost efficient link.

Ideally this corridor consists of different transport modalities (road, rail, inland navigation, short sea shipping, air,...).

Setting up corridors is embedded within the EU transport policy investing in a so-called ‘core network’. Such a core network is a combination of corridors on various lanes.



In the reference list at the end of the report an overview of all the green transport corridor projects or pilot projects on which the Food Port partners have worked, is given.

Food Corridor





**ACTION BOX C      Set up of corridors facilitating food supply chains**

<b>Introduction</b>	Corridors bundling freight flows result in substantial improvements in efficiency, effectiveness and sustainability. Both transport equipment and infrastructure capacity are better used.
<b>Goal</b>	To set up corridors connecting the food cluster with various other regions and clusters.
<b>Baseline</b>	Various transport services set up by various logistics providers and offered to a large number of shippers. Transport market is characterised by fragmentation.
<b>Horizon</b>	2020
<b>Stakeholders</b>	Initiated, stimulated and facilitated by the cluster platform, unifying the different stakeholders. The main actor who has to take the lead for the distinct actions defined in this action box is mentioned at action level (in parentheses) and is called the 'action-owner'.

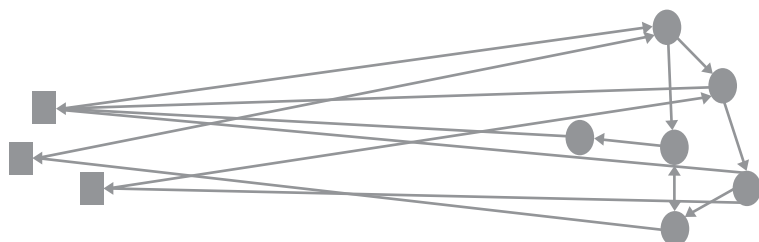
<b>Actions</b>	<p>C.1 Investigate, in an active and structural way, corridor opportunities and needs from a cluster point of view (regional or national authorities).</p> <p>C.2 Set up of new corridors through bundling of freight flows of different shippers by setting up horizontal collaboration communities (cluster management or regional authorities).</p> <p>C.3 To promote '<b>co-modality</b>' (i.e. searching for combinations of transport modes combining the respective strengths) in order to generate more adequate transport solutions for cluster connectivity (regional authorities).</p> <p>Co-modality is a context in which one combines transport modes within a transport journey, i.e. mainly in sequence.</p> <p>C.4 To promote '<b>synchro-modality</b>' (i.e. providing different transport mode solutions in parallel) in order to incorporate robustness and flexibility in cluster connectivity (regional authorities).</p> <p>Synchro-modality is a situation in which transport services are offered in parallel.</p> <p>C.5 Introduce a total logistics process or even supply chain approach in the set-up of corridors. Costs, services and sustainability need to be considered respectively from a 'door-to-door' perspective or an integrated supply chain point of view (regional authorities).</p>
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<b>Recommendations</b>	The EU needs to find an appropriate balance between sustainable transport corridors and a fair antitrust compliance policy.
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<b>Remarks</b>	Shift from easy point-to-point transport flows to challenging dense bundles of freight flows.
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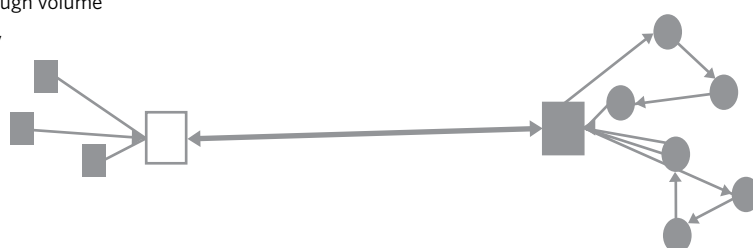
**Point-to-Point: simple**

Low effectiveness  
Low Efficiency  
Low sustainability



**Decoupling: challenging**

High effectiveness  
High efficiency trough volume  
High sustainability



Beside the actions within the boxes A to C concerning the main components of the Food Port system, there are also actions needed to provide the supportive technology.

Technology is a broad issue. Here the focus is on information and communication related technology (ICT). The information flows support the physical product flows. Work Package 4 in the Food Port Project was dealing with this subject.

It is necessary to make a distinction between the main functionalities of 'visibility' and 'control'. Through Identification, Location and Communication (ILC) technology (RFID tags, bar coding, QR codes,... ) freight flows can be tracked and traced. If it is intended to control the freight flow or the whole supply chain, a so-called control tower may be required. Bundling of freight flows requires even more ILC technology.

In action box D actions in technology are collected, supporting the Food Port System.

### ACTION BOX D Technology supporting the Food Port system

<b>Introduction</b>	Technology is an enabler to make logistics handlings happen. Information flows support the physical product flows. Technology is here limited to the information flow.
<b>Goal</b>	To stimulate appropriate ICT/ILC applications to support the Food Port system.
<b>Baseline</b>	Fragmentation in ICT systems and applications.
<b>Horizon</b>	2020
<b>Stakeholders</b>	<p>The cluster platform organisation can facilitate the implementation of appropriate and standardized ICT applications.</p> <p>The main actor who has to take the lead for the distinct actions defined in this action box is mentioned at action level (in parentheses) and is called the 'action-owner'.</p>
<b>Actions</b>	<p>D.1 Configure and disseminate ILC technology for the food supply chain. Illustrate with best practices in selected food supply chains (North Sea Region as meta food cluster).</p> <p>D.2 Configure and disseminate control towers for food clusters and/or hubs. Control towers 'control' various flows and handling within a cluster and/or hub or in a network of clusters and/or hubs (North Sea Region as meta food cluster).</p>
<b>Recommendations</b>	The EU should promote standardised ICT applications, more specifically in barcoding, RFID and QR coding.
<b>Remarks</b>	Shift from physical logistics flows to ICT enabled supply chain management.



In action box E actions related to standards are collected, supporting the Food Port System. Various types of standards could be distinguished.

Types of standards to be pursued:

1. Standards in terms of food product quality;
2. Standards in packaging and labelling;
3. Standards in transport system features (e.g. freight documents);
4. Standards in ICT technology systems (e.g. in road haulage, short sea shipping, rail transport, barge transport,...);
5. Standards in legislation (i.e. transport equipment dimensions, sulphur directive);
6. Standards in legal framework for horizontal collaborations, collaboration among 'peers';
7. Standards in reporting (e.g. carbon footprint calculation parameters);
8. Standards in tax systems and other regulations.

Standards enable and drive trade and collaboration opportunities both in a vertical (along the supply chain) and in a horizontal (across supply chains) sense. A lack of standards is an obstacle to collaborate.

The various standard can be classified as follows:

- Standards which are (food) product related (types 1 and 2);
- Standards which are logistics - transport related (types 3 till 5);
- Standards which are context - environment related (types 6 till 8).

A main issue in the domain of standards is 'Who takes the lead?' Standards in bar coding e.g. were initiated by the private sector. GS1 is an international not-for-profit association with Member Organisations in the private sector in over 100 countries. GS1 is dedicated to the design and implementation of global standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across sectors. The GS1 system of standards is the most widely used supply chain standards system in the world.

Anyway standards are needed to avoid the current mosaic or patchwork of different systems.



## **ACTION BOX E**      **Standards for the Food Port system**

<b>Introduction</b>	The logistics sector is often characterised by a high degree of fragmentation. Also the food sector is characterised by an abundance of various regulations and operational standards.
<b>Goal</b>	To generate standards for the Food Port system.
<b>Baseline</b>	A lack of standards in the Food Port system. A lack of leadership in this domain.
<b>Horizon</b>	2025
<b>Stakeholders</b>	<p>National and EU authorities need to create an appropriate framework, in close cooperation with private branche organisations like GC1, European Intermodal Association (EIA), FoodDrinkEurope, the representative body for Europe's food and drink industry,...</p> <p>The main actor who has to take the lead for the distinct actions defined in this action box is mentioned at action level (in parentheses) and is called the 'action-owner'.</p>
<b>Actions</b>	<p>E.1 To define the needs in terms of standards for agro-food and agro-food logistics. To communicate these needs to the EU policy makers (North Sea Region as meta food cluster).</p> <p>E.2 To facilitate and -E.3- to disseminate best practices in standardisation in the various fields (North Sea Region as meta food cluster):</p> <ul style="list-style-type: none"><li>▪ Standards in terms of food product quality;</li><li>▪ Standards in packaging and labelling;</li><li>▪ Standards in transport system features (e.g. freight documents);</li><li>▪ Standards in ICT technology systems (in road haulage, shortsea shipping, rail transport, barge transport,...);</li><li>▪ Standards in legislation (i.e. transport equipment dimensions, sulphur directive);</li><li>▪ Standards in legal framework for horizontal collaborations, collaboration among 'peers';</li><li>▪ Standards in reporting (e.g. carbon footprint calculation parameters);</li><li>▪ Standards in tax systems and other regulations.</li></ul>
<b>Recommendations</b>	The EU needs to stimulate and facilitate a higher degree of standardisation through creating a standard friendly legislation framework.
<b>Remarks</b>	Shift from fragmentation to integration. This integration generates gains for all parties involved.

In action box F actions are defined to stimulate and to generate innovative solutions and concepts for the Food Port system.

Focus here is on critical success factors to create a fruitful environment for innovation. An **open, collaborative, active, structural and integrative platform** is necessary to create such an environment.

## **ACTION BOX F**      **Innovative solutions and concepts for Food Port system**

<b>Introduction</b>	The innovation rate in both logistics and the food industry is rather low. Fragmentation is only one reason.
<b>Goal</b>	To increase the innovation rate in agro-food and agro-food logistics.
<b>Baseline</b>	Fragmented and diverse initiatives taken by various organisations and institutions.
<b>Horizon</b>	2020
<b>Stakeholders</b>	Knowledge institutions – competence centres – universities.  Private companies – branch organisations.  The main actor who has to take the lead for the distinct actions defined in this action box is mentioned at action level (in parentheses) and is called the ‘action-owner’.
<b>Actions</b>	F.1 To set up a knowledge platform incorporated in the cluster platform organisation (regional or national authorities).  F.2 To stimulate collaboration among the various knowledge institutions, competence centres and universities through the set up of funded projects dedicated to agro-food and agro-food logistics (cluster management).  F.3 To disseminate innovative concepts in the field of agro-food and agro-food logistics through various channels (food cluster website, newsletter, social media, events, conferences,...) (cluster management).
<b>Recommendations</b>	The EU should incorporate agro-food in general and agro-food-logistics in particular as niches with a strategic importance in the various EU, national and regional research and innovation programs.
<b>Horizon</b>	From a basic logistics solution to a smart supply chain organisation.



If the North Sea Region wants to reach **a top position as an agro-food region**, structural cooperation between the various stakeholders, both public and private actors will be required. The authorities should take the lead to create a kind of **public entrepreneurship**, in other words an (pro-)active government role.

With combined (bundled) forces, the North Sea Region can attain in 2020 a European leadership in agro-food. The actions defined in the above introduced action boxes should help to realize the opportunities. The **excellent “breeding ground”** - literally and figuratively - for agro-food logistics must be optimally utilized, exploited and valorised into sustainable prosperity.

The first main conclusion is, that a clear scope for the Food Port Region, supported by an appropriate policy and an adequate organisation, with **a clear and focused mission and vision is needed**.

The scope for the various agro-food-logistics clusters in the North Sea region is case-specific and quite broad, but focussed on **vertical chain integration, horizontal collaboration and multimodal connectivity**.

In order to realize their mission, the North Sea agro-food Regions need to develop **a platform** which is in the first place **open, collaborative, active, structural and integrative**.

In the first place the platform enables a network of people working together in knowledge sharing, creating and valorisation, business development, shared services, bundling of freight flows, setting up corridors,...

The **unique selling or value proposition (USP)** of the agro-food cluster lies in the **powerful combination of agro-food-business and logistics**. Consequently, the North Sea Region must therefore profile itself above all, not as an agro-food cluster, not as a logistics cluster, but as an agro-food-logistics ‘cluster of clusters’! This **“meta-cluster”** can get a prominent, “future-proof” position in agro-food in the world.



All reports will be available for download via [www.food-port.eu/downloads](http://www.food-port.eu/downloads)

### WP 3 – Supply Chain Sustainability and Efficiency

#### WP 3.1 Realization of green transport corridors for food products

- Report Corridor 1 – Rosyth-Zeebrugge ferry service – strengthening existing port-to-port ferry service.
- Study Corridor 1 – Rosyth –Zeebrugge Ferry Service – Business Impacts – Report November 2011.
- Study Corridor 1 – Rosyth –Zeebrugge Ferry Service – Business Impacts – Update Report November 2012.
- Report Corridor 2 – The Findus Case – how to reduce cost and environmental impact for Swedish food export and import.
- Report Corridor 3 – Short Sea Shipping corridor between Mid-Norway and Bremerhaven - Feasibility Study.
- Report Corridor 4 – Lifting the spirit – whisky by rail.
- Study Corridor 4 – Lifting the spirit – whisky by rail – environmental analysis.
- Report Corridor 5 – Hitra Case – set up of an intermodal food corridor between Hitra and Zeebrugge.
- Report Corridor 6 – Scandinavia platform – set up of a food corridor between West Flanders and Västra Götaland.
- Report Corridor 7 – Port of Oostende-Saint Petersburg short sea service – set up of a food corridor between West Flanders and Saint Petersburg area.
- Report Corridor 8 – Agro Food Logistics in Denmark – setting up a new Food Port corridor from Padborg to Rotterdam.

#### WP 3.2 Clustering of Food Logistic Activities – Realisation of Food Hubs or Food Distribution Centres.

- Action Plan 1 – Action Plan of Region Västra Götaland for the realisation of food distribution hubs.
- Action Plan 2 – Action Plan of Hitra/Frøya – “The Salmon Region” for the realisation of a food distribution hub.
- Action Plan 3 – Action Plan Port of Zeebrugge for the realisation of a food distribution hub.
- Action Plan 4 – Action Plan Port of Gothenburg for the realisation of a food distribution hub.
- Action Plan 5 – Action Plan of Scotland for the realisation of food distribution hubs.
- Action Plan 6 – Action Plan Padborg hub for the realisation of a food distribution hub.

### WP 4 – Physical System Support

#### WP 4.1 ILC Technologies in the Food Supply Chain

- Report on ILC technologies in the Food Supply Chain.
- Fish Box Pool Project: Region Vastra Gotaland (SIK + Lund University): “Challenges in utilising RFID in international fresh food supply chains.” Henrik Ringsberg & Gustaf Zettergren.

## **WP 4.2 Smart Transport Means**

- Case study 1 – the Port of Odense and University of Southern Denmark – “The potential of adopting returnable transport packing systems in food transport”.
- Case Study 2 – Deutsche See – tests to achieve a longer shelf life of fresh fish.

## **WP 5 – Enhancing Market Knowledge**

### **WP 5.1 Scan of regional food clusters**

- Summary report – Scan of Regional Food Clusters in the North Sea Region.
- Report – Scan of Regional Food Clusters in the North Sea Region.

### **WP 5.2 Inter and intra regional food product flows**

- Summary report – Inter & Intra Regional Food Products Flows: Green Transport Corridors for Food Products.
- Report – Whisky Logistics Study – spirit of the Highlands (study realised by Hitrans before the Food Port project).
- Executive Summary of the report “Identification and analysis of food flows in Västra Götaland”

### **WP 5.3 Food Logistic Cluster Management**

- Action Plan 1 – Action Plan of West Flanders for Food Logistic Cluster Management.
- Action Plan 2 – Action Plan of Kristiansund & Nordmøre Harbour for Food Logistic Cluster Management in the Hitra/Frøya – Nordmøre region (Mid-Norway).
- Action Plan 3 – Action Plan of Bremerhaven for Food Logistic Cluster Management.
- Action Plan 4 – Action Plan of Scotland for Food Logistic Cluster Management.
- Action Plan 5 – Action Plan of Region Västra Götaland for Food Logistic Cluster Management.
- The Food Port Transnational Action Plan (this document).

### **WP 5.4 Sustainable food logistic scenarios.**

- Report on Sustainable Food Logistic Scenarios.
- Report – Cost and time models for road haulage and intermodal transport using Short Sea Shipping in the North Sea Region.
- Study by the Port of Gothenburg – “LCA of food transports and tomato production. A comparison of different food transport scenarios, including production of tomatoes”.





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