Impact of the Fixed Fehmarn Belt Link on the Transport of Forest Products from Northern to Central Europe

TENTacle [WP 2, Activity 2.1]

Version: final [05.02.2018]

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Abbreviations

BSR	Baltic Sea Region
BSRP	Baltic Sea Region Programme 2014-2020
CNC	Core network corridors
FBFL	Fehmarn Belt Fixed Link
SECU	Stora Enso Cargo Unit

Literature

No.	Titel
[1]	European mega-project collaboration deal http://www.tunneltalk.com/Denmark-Germany-Austria-Italy-100ct2016-
[2]	Entwicklung des Seetransportes und des Hafenumschlages von Forstprodukten im Ostseeraum bis 2030 BMC, 2016
[3]	Verkehrsprognose für die Feste Fehmarnbeltquerung 2030 Intraplan, BVU, 2016
[4]	Sveriges officilla statistik, Stockholm 2013
[5]	file:///C:/Users/Luesch/Downloads/Kombiverkehr_Direktz%C3%BCge_2017-02-23.pdf
[6]	Transport Analysis, Swedish Transport Administration, Stockholm 2014
...	...

Executive summary

Almost half of the 60 million tons of forest products produced each year in Sweden and Finland are exported to the EU-28 countries. Of this, a little more than 20 million tonnes is carried to the hinterland of the German Baltic Sea ports or the on the Fehmarn Belt Fixed Link (FBFL) as defined in this study. This quantity is shared between the transport modes shipping, rail and road.

The FBFL reduces the distance for rail and direct road transport by 160 km. It is therefore to be expected that maritime transport will lose cargo to rail and road. This will primarily affect exports from Southern and Central Sweden. In conjunction with foreseeable structural changes in the production of forest products (wider range of varieties offered combined with smaller batch sizes for paper, more high-quality pulp) and the expansion of modern rail infrastructure, higher market shares for rail transport are expected, especially for combined transport. In our opinion railways will increase their share in the export of Swedish forest products from the current level of around 25% to roughly 30% after opening the FBFL. The shift is expected to take place almost exclusively through the switch to combined transport at the expense of direct road transport, thus in part at the expense of ferry connections.

The ferry operators and port operators in the Baltic Sea have little chance of securing their current transport shares, since the construction of the FBFL is highly subsidized and constitutes a political rather than an economic decision. However, especially for the cargo segment of forest products exports from Southern Sweden to Central Europe, we see some opportunities to preserve their positions, by means such as

- development of logistics services for the forest industry in southern Baltic Sea ports, in particular by taking over the distribution function in the hinterland,
- further expansion of efficient combined transport services.

1 Objective and goal

Between 2014 and 2014 a total of forestry products of about 25 million tonnes were traded between Northern and Continental Europe. Of this, more than 22 million tonnes flow in a southern direction, the sources of which are almost entirely in Sweden and Finland. The goods are carried by ship, rail or road.

The planned Fehmarn Belt Fixed Link (FBFL) is relevant for the transport of forestry products from southern Sweden to Central Europe (Fig. 1). The FBFL is an alternative to the existing railway or road transport routes which either run through Jutland or use the ferry connections crossing the southern Baltic Sea. Compared with the Jutland route, the connection over the Fehmarn Belt is about 160 km shorter. In particular, the railways expect volume increases caused by:

- shift from road to rail,
- the expansion of the catchment areas of the railways on the one hand towards central Sweden and on the other to Western Europe, so that shifts from sea transport to railways are possible;
- the rail transport capacity increase per se.

In addition, the two remaining rail ferry connections Rostock-Trelleborg and partly also Swinoujscie-Ystad are expected to lose cargo after the commissioning of the FBFL.

Figure 1: Fehmarn Belt Fixed Link in the Trans-European Transport Network (sector)

The aim of the investigation is to assess the expected impact of the FBFL on the modal split in the transport of forestry products. Only Swedish exports are considered, since Swedish imports of forest products from Central Europe are significantly lower and, in principle, have little affinity to rail transport.

In addition, the consequences for the ferry lines and the ports in the southern Baltic Sea are to be shown and possibilities will be discussed for how maritime transport and ports can secure their market shares.

2 Transport of Northern European forest products to Central Europe

In this study forest products comprise sawn wood, pulp, paper and cardboard. Round timber transports are not relevant for the FBFL. EUROSTAT classifies sawn wood, pulp, paper and cardboard in the NST 2007 groups 06.1 and 06.2 (Table 1).

Table 1: Classification of forest products in NST 2007

NST 2007 GROUP	*DESCRIPTION LONG*	*DESCRIPTION SHORT*
06.1	PRODUCTS OF WOOD AND CORK (EXCEPT FURNITURE)	WOOD (SAWN WOOD)
06.2	PULP, PAPER AND PAPER PRODUCTS S	PAPER

The total quantity of sawn timber, pulp and paper / cardboard produced annually in the last decade in Sweden and Finland amounts to a total of around 60 million tonnes. About 45 million tonnes (75%) are exported. The share of the EU-28 countries in the total export volume was 63% in 2014. Other important exports recipients are Norway, Russia, the Mediterranean, North America and East Asia (China).

The traffic forecasts for the FBFL cover the entire continental European area as a southern catchment area. For forest products, it seems sensible to limit this area, since South-Western, Southern, South-Eastern and Eastern Europe is served mainly by routes not relevant for the FBFL. For forest products, Germany, the Benelux countries France, Austria, the Czech Republic, Slovakia, Hungary, Switzerland and Italy can be defined as a *southern hinterland* for the FBFL, in the same way as it is usual for the southern Baltic Sea ports [2]. This area is hereinafter referred to as Central Europe.

For the export of forest products by road and rail to Central Europe, the area south of a line between Stockholm and Oslo will be determined subsequently as the *northern catchment area* of the FBF. The reasons for this definition are:

- Finnish exports are almost exclusively shipped by sea, either with lolo-ships as bulk cargo or with roro-vessels, with the use of rolltrailers or cassettes as cargo platforms or on board of container ships.
- The same applies to exports from Northern Sweden. In addition to the transport cost advantages of maritime transport, the existing railway infrastructure does not meet the required standard for competitive rail freight transport. Often there are no direct railway connections to the factories.

In 2014 a total of almost 22 million tonnes of forest products from Sweden and Finland was exported to the defined above hinterland of the southern Baltic Sea ports and the FBFL 4 [2]. The development of the total export volume since 2001 is shown in Fig. 2.

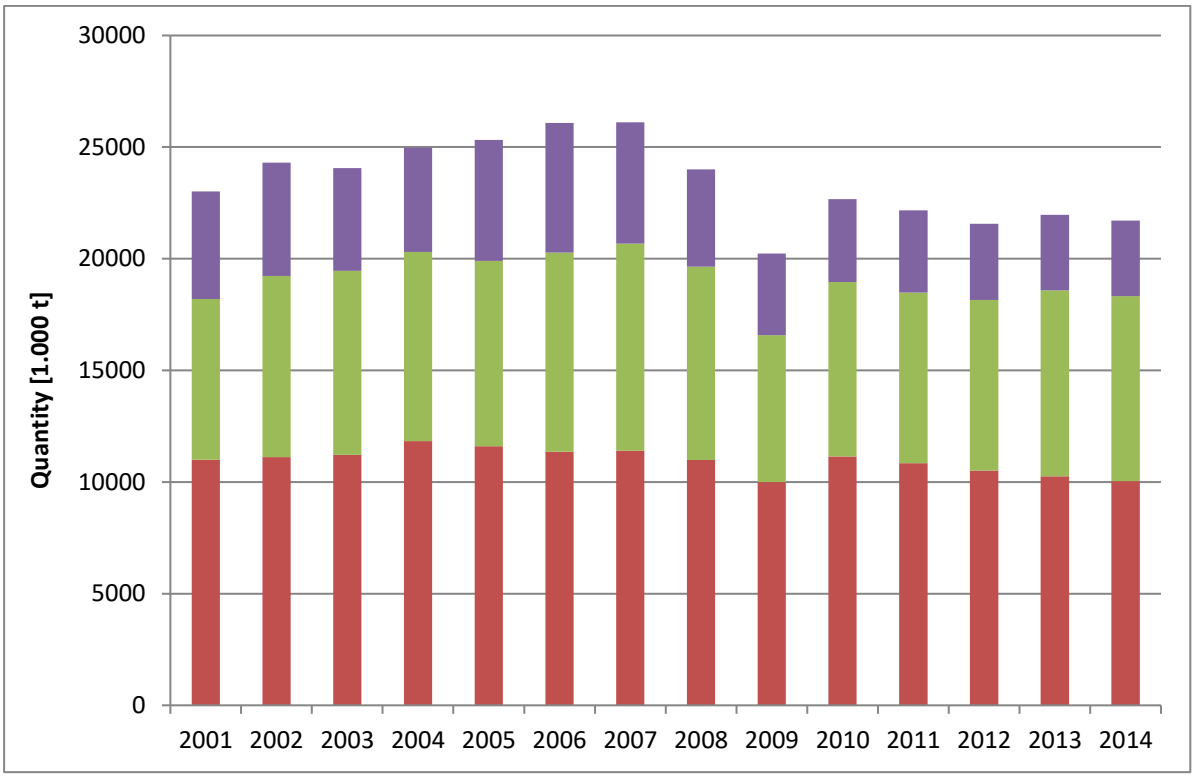


Figure 2: **Swedish and Finnish export quantities to the hinterland of Southern Baltic ports 2001 - 2014**
(purple: sawn timber; green: pulp; red: paper)

It is difficult to determine the forest products transport potential of the FBFL from southern Sweden to the defined central European countries. However, it can be roughly estimated basing on the distribution of Swedish pulp and paper production capacities. Approximately 60% of the large paper and pulp factories (capacity each > 100,000 t/a) and sawmills are located south of the Stockholm - Oslo line. In 2014, the total amount of forest products shipped from southern Sweden to Central Europe amounted to about 7.5 ... 8.5 million tonnes (see Appendix 1).

However, this quantity is not transported exclusively by rail or road, which is, of course, to a considerable extent including a ferry leg, but also by other forms of sea transport. This applies in particular to pulp and, to a lesser extent, to paper transports (in SECU boxes), which travel via the North Sea ports to the western part of the destination area. In our opinion, this volume amounts to just under 2 million tonnes. Railways, inland waterways vessels and the truck take over the final run. If the transport costs of the railway through the FBFL should drop significantly, the sea transports may be partially susceptible to modal shift.

Statistical confirmed data on the current modal split forest products transport from southern Sweden to the defined hinterland of the FBFL are not available, too. The main reason for this is that data coverage at the level of the NST 2007 groups is incomplete, particularly in the case of road transports and, in part, also rail transports. Only for the Swedish exports of forest products as a whole in 2012 are data available (Table 2), which are not specified regionally with respect to origin and destination. In this respect, the current modal shares of the individual traffic types in the transports to the central European hinterland assigned to the FBFL can only be roughly estimated. The following aspects were considered for the modal split estimate:

- The export share of the Swedish forestry industry is relatively evenly distributed.
- The share of road transport is disproportionately high in exports to the surrounding countries (Norway, Denmark, Finland).
- There are no road and rail transports to the UK, Ireland and Iceland (with the exception of a small quantity that uses the ferry and roro connections with trucks or trailers).
- Apart from the ferries between southern Sweden and the continent, which must be allocated to road and rail transport, the share of maritime transport is below the average for exports from southern Sweden and focuses on Western Europe and the Mediterranean as destination.

Table 2: Modal split of exports of Swedish forest products in 2012 [%] [6]

TRANSPORT MODE	*PAPER/BOARD*	*SAWN WOOD*	*TOTAL FOREST PRODUCTS*
Rail	14	0,5	10
Road	19	38	25
Sea	67	61,5	65
Sum	100	100	100

The amount of Swedish forest products exports, which is potentially relevant for the FBFL, was estimated to be around 12 million tonnes. The modal split was also estimated. The data refer to the year 2014.

Production volume in South Sweden for export in total	11.8 million tonnes
thereof about 68% in the FBFL hinterland	8.0 million tonnes
thereof maritime transport (22.5%)	1.8 million tonnes
thereof rail (25%) is	2.0 million tonnes
thereof road (52.5%) is	4.2 million tonnes

The share of rail transports rose slightly in connection with the declining exports after the economic and financial crisis, while road transports declined in absolute and pro rata terms.

The FBFL is to start operation in 2028 according to current plans. However, railways plans so far have foreseen that the full capacity for rail traffic will be reached only two years after the opening of the tunnel. It therefore seems necessary to outline the expected developments in the forestry industry as well as the consumption and trade of forest products, which have an influence on the transport volume and the modal split in the region under consideration. The main trends are [2]:

- The per capita consumption of printing paper is declining and in Central Europe there are overcapacities owned by some Swedish companies which are reduced or converted to other products (cardboard, hygienic paper).
- The demand for packaging materials (cardboard) and hygienic paper grows but does not fully compensate for the decline in printing papers.
- In the production of cardboard, a large amount of recycled material is used so that factories close to the market have a location advantage.
- Both the consumer-oriented production of packaging material and hygienic packaging requires pulp supplies, which come partly from overseas, but to a large extent also from Northern Europe.
- The storage capacities at end-users (e.g., large-scale printers) are reduced so that in conjunction with increasing paper variety and smaller batch sizes the proportion of just-in-time deliveries increases.
- In order to maintain or expand the value added of the forestry industry in Sweden and in Northern Europe in general and to make optimum use of the available raw wood supply, the production in existing paper mills is partially converted to high-quality market pulp. In addition, all segments of forestry and paper production are trying to produce higher-quality and partially processed products, such as special-coated sawn wood, construction materials, prefabricated houses, specialty papers, coated boards and already labelled packaging etc.
- The container as a loading unit for forest products is also gaining in importance for intra-European transports. Since some ports in the South of Sweden are connected by feeder vessels to the large container terminals in the North Sea ports, these containers partially use the North Sea ports to serve the western part of the central European hinterland.

- Free transport capacity (trucks and wagons) in the southern direction will continue to be available in Northern Europe because of the imbalance of the goods transport flows. This applies more to road transport than to rail transport.
- Politically, a bigger share of rail and sea in total freight transports is desired for environmental reasons, and at least the efficiency of the core network of railways is being raised.
- Nevertheless the number of direct rail connections will not increase substantially between the Swedish producers and their Central European customers. For this reason, rail transport frequently will still require road front-haulage and road follow-up runs. This applies generally with a few exceptions also for sea transport, whereby in pulp transport inland waterways vessels also have larger transport shares in post-carriage transport, since some continental paper factories have direct inland waterways connections.

Considering the above tendencies, the modal split when transporting forest products from southern Sweden to Central Europe in the foreseeable future will change little. The conditions for the formation of more block trains will hardly improve. Shifts are likely to occur in the main runs of road trailers which can benefit from improved combined transport services and are then will be allocated to railways. This also automatically affects the ferry traffic.

3 The place of the FBFL in the Scandinavia -Central Europe transport system and the development of forest products shipments by 2030

In addition to the existing route across the Great Belt and the Oresund, the FBFL is to create a further fixed link between Central Europe and Southern Sweden for road and rail transport. In addition, a series of ferry lines cross the southern Baltic Sea between Southern Scandinavia and the continent, two of which also carry freight wagons (Figure 4). For rail transport, which is currently mainly using the Jutland route, the FBFL creates a 160 km shorter route between the two important railway junctions, Malmö and Maschen (south of Hamburg).

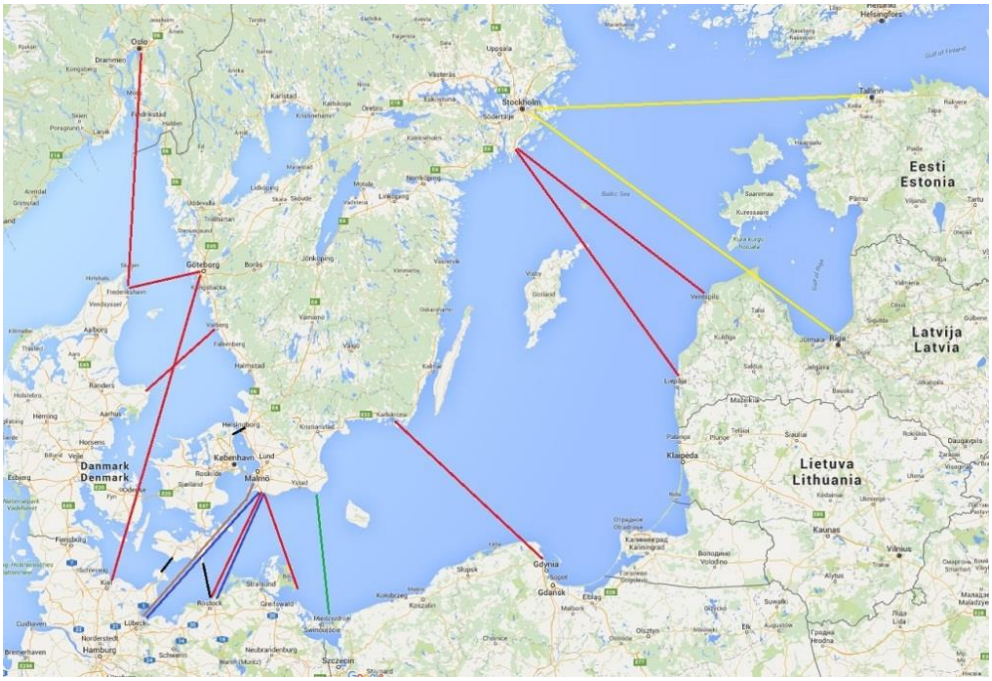


Figure 3: Ferry connections over the southern and central Baltic Sea

In the traffic forecasts developed for the FBFL, the eastern section of the so-called "Baltic Sea cut", the limit between Scandinavia, including the Danish islands and continental Europe, was drawn at Bornholm Island. In the currently ongoing plan approval procedure, the forecasted quantity of goods, which is exchanged as a whole via the east coast between Scandinavia and the continent, as well as the distribution of the traffic shares on the individual types of traffic and the alternative routes, are regarded as too high by the opponents of the FBFL. The basis is the so-called FTC forecast of 2002 [3], updated in 2014 and 2016 respectively. The total volume of goods transported between Scandinavia and continental Europe by road and rail in 2011 amounted to 28.8 million tonnes. According to the forecast, this volume should grow to 41.3 ... .45.8 million tonnes by 2030.

Since the source and target areas were selected in [3] considerably larger then useful for forest products, the basic data as well as the expected prognosis values can only be used to a limited extent for the estimation of the expected effects of the FBFL on the transport of forest products. However, the growth data used for the forecast, the assumptions for the development of the modal split, and the shifts between the FBFL and the ferry line may be used.

Table 3 shows the growth forecast for Sweden as a whole as well as that expected for forest products exports to Central Europe by 2030, as forecast in [3]. Base year is 2011. The export volumes for 2011 are only slightly different from the values of the Swedish traffic statistics used in section 2 [4]. The growth data refer to variant A of the prognosis, which is somewhat smaller than that in variant B. In the discussion about the FBFL variant A is generally preferred. The export of forest products to the continental European region is expected to grow by 1.4% annually. In variant B, growth is estimated to be slightly higher at 1.7% annually. Compared to the 2002 base case and the first update, growth rates for forest products have been slightly reduced.

Table 3: Forecast of Swedish exports 2030
Variant A (total and forest products in million tons based on [3])

SWEDISH EXPORTS	2011	2030	ANNUAL GROWTH RATE 1995-2011	GROWTH 2004-2014	ANNUAL GROWTH RATE 2011-2030	SHARE IN TOTAL EXPORTS [%]		
						1995	2011	2030
total	88,2	103,1	1,9		0,8	100,0	100,0	100,0
total continent	31,9	38,1	0,6		0,9	44,3	36,2	36,9
total forest products	22,6	29,9	1,5		1,5	27,3	25,6	29,0
forest products, Central Europe	**10,4**	**13,6**	**1,3**	**- 0,6**	**1,4**	**12,9**	**11,8**	**13,2**

From our point of view, however, there are no strong arguments for such high growth expectations. The main reason for the very high prognosis, among other things, is based on the fact that the chosing 1995 as base year results in a very long period for the assessment of the development up to now. In these years, a great deal of change took place in the production, consumption and trade of forest products, which will continue in the foreseeable future. In recent years, the export volume from Scandinavia to the continental European countries has largely stabilized and is currently somewhat below the level of 2000.

Taking into account the development trends shown in section 3, we therefore expect only slight growth in the production volume and exports of Swedish forest products to Central Europe by 2030. We estimate growth in the range of 0 ... 0,5% p.a. We expect to see growth in pulp and higher graded products (sawn wood, specialty paper, finished packaging, etc.) and further declines in printing papers. In this respect, we do not expect any significant volume growth. In our opinion the amount of forest products relevant for the FBFL should be in the range of 12 to about 13 million t/a in 2030.

4 Possible changes in the modal split forest products exports to continental Europe and shifts from the ferry lines to the FBFL

The current modal split for the export of forest products from southern Sweden to the central European hinterland was roughly estimated under point 2. These figures can only be compared to the basic data used in [3], since different catchment areas and reference years were used. In addition, the values assumed in [3] refer to the whole general cargo transport, whereas only forestry products are considered here.

The share of the railways is 21% (base year 2011) for total goods exports to continental Europe in [3], while a value of 25% (2014) was estimated specifically for forest products. Perhaps the difference is already explained by the reduced catchment area for forest products in Southern Sweden because the conditions for rail transport are more favourable there than in Northern Sweden.

In the period from 2011 to 2030, the volume of rail freight transport will increase altogether, but the railways share in Swedish freight transports to continental Europe will only marginally change (Table 4). This is not entirely in line with the expectations of the railways, which are based on a slightly growing modal share.

Table 4: Volumes and shares of road and rail in Swedish general goods exports to continental Europe [3]

	2011	2030		Annual growth rate 2011-2030	
	Base year	Base case A	Base case B	Base case A	Base case B
goods, road	22.610	32.745	35.634	2,0 %	2,4 %
goods, rail	6.164	8.543	10.132	1,7 %	2,7 %
total	28.774	41.288	45.766	1,9%	2,5 %

We also expect partial increases in the share of railways in the total traffic through the construction of the FBFL. In our opinion the shortening of the route length compared to the Jutland route is of less weight then the resulting higher transport capacity for rail freight transport combined with additional offers of combined transport services. The conceivable extent of modal shift is to be roughly estimated below.

For the export of forest products from Southern Sweden to the catchment area of the FBFL, the following transport alternatives are considered:

- Block trains if sender and receiver have a direct siding.
- Single carriage or wagon groups, which are currently grouped into whole trains in Malmö, and for the most part are rearranged according to destination stations in Maaschen. A smaller and declining part of the wagons is carried on railroad ferries and integrated into different nodes in the hinterland of the FBFL in consignments or runs as a block train to the receiver. This variant is particularly suitable for larger parties carried from exporting factories recipients with both having railway sidings.
- Combined transport with direct block trains between combined transport terminals in southern Sweden and the FBFL hinterland. The pre- and post-carriage are on the road. Taking into account the existing and planned transport infrastructure, the average transport distance, the batch size development as well as the number and distribution of origins and destinations, combined transport is probably the most effective solution for the future. For the crossing of the Baltic Sea cut, for time reasons the fixed crossings are mainly used.
- Combined transport with block trains, which are formed in southern Sweden and in shunting yards - primarily in Malmö and Maas – are converted in block traisn acco5rding to destination. Both the pre- and post-carriage are carried out on the road again.
- Direct truck transport from the consignor to the consignee either via the fixed crossings or using ferries.
- Sea transports with pre- and post-carriage by truck, railway or inland waterway vessels.

Beside these main variants there are still some special solutions. For example, if the production sites and / or the receivers are located directly accessible by sea ship, the direct sea transport is a cost-effective option. However, this variant is the exception for the transport of forestry products from southern Sweden to recipients in Central Europe.

The volume share of the southern Swedish pulp and paper factories as well as the sawmills exporting to the continental catchment area of the FBFL was estimated at 60%. Over 50% of pulp and paper factories with a capacity of > 100,000 t / a have a direct railway siding. This share is smaller for sawmills. With very few exceptions, the lot sizes should not suffice for block train formation. At the most, wagon groups can be used. The proportion of recipients with direct rail connections is likely to be even lower.

Considering also the fact that the total export and import volumes are nearly balanced in the exchange of goods with continental Europe, considerable transport capacities in the south direction would not be utilized without the forest products esports. As a result of the heterogeneous product and value structure, the relatively small lot sizes and the spatial structure of the origins and destinations for Swedish imports, the high proportion of road freight transport is understandable. This is unlikely to change in the foreseeable future. Consequently, as already indicated in section 2, the combined transport could lead to slightly increasing shares of the railway in the main course in the future. To what extent this materializes depends on several factors.

An essential prerequisite is the development of the combined transport infrastructure, and on this basis of an offer of direct connections with high frequency, short transport time and competitive prices. Fig. 5 shows the combined transport connections offered by Kombiverkehr and its partners in Southern Sweden. Entry possibilities in combined transport currently exist only at the edges of the catchment area. Correspondingly long are the mean pre-carriage distances for road transport.

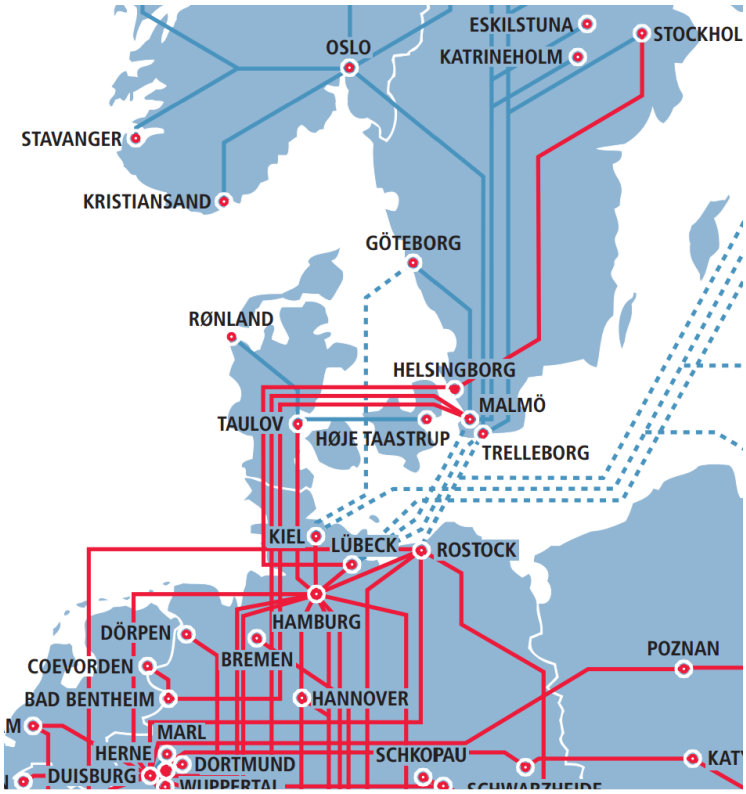


Figure 4: **Kombiverkehr network of combined transport connections (red: direct traffic, blue: aerial traffic or ferries) [5]**

The development of railway infrastructure and the possible extended supply of direct combined transport connections are dependent on demand growth. In our opinion, demand of the forestry industry will grow only slightly. On the other hand, however, considerable quantities of forestry products are being transported in single wagon or by block trains to the south. The same applies largely for containers loaded with paper, which are currently mainly using sea feeder services. If it is possible to combine these traffic flows at least partly by means of "combined trains", in Southern Sweden additional nodes can be added to the existing network, offering transhipment options for trailers and containers and, on the other hand, permit the coupling of smaller wagon groups into direct combined transport block trains. This approach has long been a development strategy for the railways in freight transport. Practice shows how difficult their implementation is. Nevertheless, we expect that in the period up to 2030, additional access possibilities for forest products in new railway connections will be created in the southern Swedish region.

In addition to the 4-lane road connection, the FBFL receives a two-track electrified railway line. Although the operating speed of the Hamburg - Copenhagen route has not yet been definitively established, a speed of 200 km / h is likely for passenger traffic in the region. 160 km / h can be expected for freight traffic. The capacity for goods trains is given as a function of the final operating speed and the intensity of passenger traffic (about 40 passenger trains per day). 70 to 90 freight trains per day can be expected. However, the capacity of the Öresund bridge for freight trains at the time of the commissioning of the FBFL possibly is lower because of the high number of local trains. Up to now, an average of 30 freight trains daily passed the Öresund Bridge in the peak year (2011).

The extent to which the expected continuation of regional transport and the additional long-distance traffic induced by the FBFL will affect the freight trains capacity of the Öresund Bridge in 2030 is assessed differently. In this context, we assume that there will be no capacity constraints on rail freight transport.

In a rough estimate railways will increase their modal share in the export of Swedish forest products of currently about 25% by construction of the FBFL to about 30%. The shift would be almost exclusively due to the expansion of combined transport at the expense of direct road transports and thus, also the ferry connections.

5 Recommendations for the maritime industry to secure their transport shares

Exports of forestry products from southern Sweden to continental Europe pass through the ports in the southern Baltic Sea exclusively with direct truck, trailer and rail transports using the ferry connections. For railway freight transport, the FBFL is a cost-effective alternative to the Jutland route. The railways will make good use of this option up to their capacity limit.

In [3], it is therefore assumed that railways will completely shift freight traffic to the FBFL, that is, both the traffic over Jutland and the railroad traffic between Rostock and Trelleborg. The reason for this assumption is the high capacity of the FBFL in relation to the projected growth. Since transports of forest products in our opinion will not contribute substantially to the growth of rail transport and therefore the traffic volume estimated in [3] for the railway is too high, this approach is not unjustified, at least in relation to the FBFL.

Shifts from the ferry lines to the FBFL are to be expected, in particular, by the changeover from direct truck transports to combined transport. At least, if the combined transport connections offered from the Baltic Sea ports to the same destinations are also served directly from southern Sweden, major declines are possible in the Baltic Sea ports. This appears, in our opinion, only partially possible, especially since the combined transport connections emanating from the Baltic Sea ports also transport units for a large number of other Baltic Sea regions and thus have a comparatively high overall output.

Shifts from the ferry lines to the FBFL can also occur in the segment of direct truck transports, i.e. in the case of vehicles loaded with southbound forestry products. In addition to the migration to combined transport , especially when new direct combined transport connections are established between Southern Sweden and Continental Europe, FBFL planners assume that the time advantages of the FBFL for truck transports are the reason for changes in the routing to the disadvantage of ferries. In the discussion about the displacement potential, some assume that the time advantages are overestimated in the forecast and that the possibility of compensating for legally required rest during the ferry crossing is underestimated.

In any case, there will be shifts in at the expense of ferry routes by the FBFL in both rail and road freight traffic. There are small chances for the ferry operators and port operators to safeguard their current traffic volumes, especially as the highly subsidized construction of the FBFL is, in our opinion, not an economic but a political decision. Particularly for the cargo segment of forest products exports from southern Sweden to Central Europe, however, we see some opportunities to maintain their positions:

Strengthening the services offered to the forestry industry, in particular by performing the local and regional distribution, where appropriate, to the wider hinterland of the ports and by the establishment of companies specialized in these tasks. Ports are still favourable distribution centres due to their generally excellent transport connections to the hinterland. An efficient combined transport service offer is becoming increasingly important.

The large Scandinavian corporations of the forestry industry are increasingly bundling their diverse transport and distribution activities from a global perspective in a few locations. This includes, among other things, exports and imports, corporate in-house deliveries as well as the handling and storage of a wide range of cargoes. Various types of vessels and means of transport are used. On the harbour side, this requires more universal, efficient systems.

The ports in the southern Baltic Sea are, in our opinion, despite the insufficient connectivity in container traffic, in a good position to become major ports for Nordic forest products industry corporations.

Annex 1: Billerudkorsnäs group- overview of sea transport

Billerudkorsnäs		Sweden			Finland			Remarks
	Dim.	Saw mill	Pulp mill (Market pulp)	Paper mill	Saw mill	Pulp mill (Market pulp)	Paper mill	
Number of mills	[-]	0	2	5	0	0	2	
Capacity	[1.000 t/a]	0	350	1.510	0	0	300	
Importand production sites			Karlsborg Skärblacka	Frövi/Rockhammar Gävle Gruvön Karlsborg Skärblacka			Pietsaari Tervasaari	
Captive terminals								
Ports of shipment		Gävle, Göteborg, Norrköping			Jakobstad- Pietasaari			
Major ports of importation		diverse						
		BillerudKorsnäs AB PO Box 703 SE-169 27 Solna Sweden			BillerudKorsnäs Finland Oy Larsmovägen 149, 68600 Jakobstad, Finnland			
Logistics division								
Contact logistics division		info@billerudkorsnas.com						
Web presence		https://www.billerudkorsnas.com/						

Billerudkorsnäs – Important port terminals

Norrköping, Pampus-Terminal	Gävle, CFS Granudden
	
Capacity: ca: 1.000.000 t/a (breakbulk) Storage: ca. 33.000 m²	Capacity: ca: 500.000 t/a Storage: ca. 50.000 m²
LoLo	LoLo
Feeder-terminal	Feeder-terminal (nearby)
Ola Hjärtström, Market Manager pampus@norrkoping-port.se	Torbjörn Johansson, tel +46 7016 75297

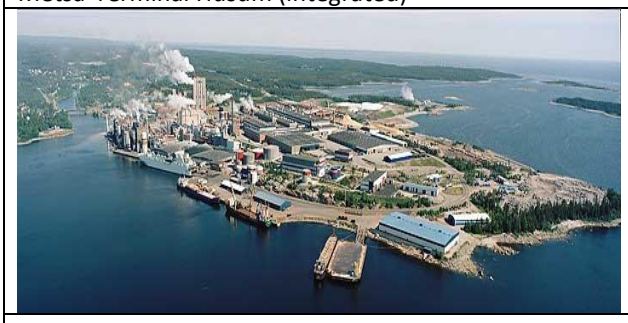
Jakobstad- Pietasaari	
	
Capacity: 600.000 t/a Forstprodukte Storage: 40.000	
RoRo and LoLo	
Billerudkorsnäs beside StoraEnso	
Operator Euroports	
Terminal manager,	

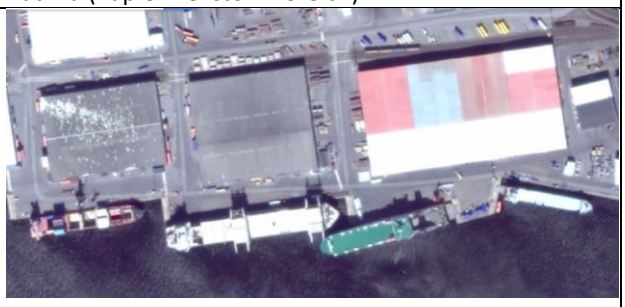
Annex 2: Metsä Group - overview of sea transport[1]

Metsä Board		Schweden			Finnland			Remarks
	Dim.	Saw mill	Pulp mill (Market pulp)	Paper mill	Saw mill	Pulp mill (Market pulp)	Paper mill	
Number of mills	[-]		1	1	6	6	5	
Capacity	[1.000 t/a]		630	636	1.340	3.080	1.070	
Importand production sites			Husum	Husum		Joutseno Kaskinen	Äänekoski, Kemi, Kyro Simpele Tako-Tampere	Paper mill Svir (RUS)
Captive terminals								
Ports of shipment		Holmsund, Husum, Tunadal, Iggesund			Joutseno, Kaskinen, Kotka-Hamina, Kemi, Vousaari			Vousaari for pulp (2014 new contrac particular for Äänekoski)
Major ports of importation		Lübeck, Gdansk			Gdansk, (Spanien, Italien etc. pulp)			
Logistics division								
Contact logistics division		Jyrki Ranki, VP, Logistics, Jyrki.ranki@metsagroup.com			Jyrki Ranki, VP, Logistics, Jyrki.ranki@metsagroup.com			
Web presence		https://www.metsagroup.com			https://www.metsagroup.com			

[1] Metsä Board, Metsä Wood, Metsä Fibre only, without Metsä Tissue and Metsä Forest

Metsä – Important port terminals

Metsä-Terminal Husum (integrated)	Kaskinen (Port of Kaskinen, public)
	
Capacity: ca. 2.000.000 Storage:	Capacity: ca: 350.000 t/a (Stückgut) Storage: ca. 38.000 m²
RoRo and LoLo	LoLo
Mill manager: Anders Ek Tel. +(0)72 736 11 65 anders.ek@metsagroup.com	Mill manager: Timo Rissanen, Tel. +358 50 528 3988 timo.rissanen@]metsagroup.com

Wagenborg-Terminal Eemshaven	Rauma (Papier-Zellstoff-Bereich)
	
Capacity: ca: 2.500.000 t/a Storage: ca. 60.000 m²	Capacity: ca. 3.000.000 Storage: 250.000 m²
RoRo and LoLo	RoRo and LoLo
in GC-Terminal integrated	Feeder-Terminal (nearby)
Email: stevedoring@wagenborg.com	

Annex 3: SCA group - overview of sea transport

SCA		Schweden			Finnland			Remarks
	Dim.	Saw mill	Pulp mill (Market pulp)	Paper mill	Saw mill	Pulp mill (Market pulp)	Paper mill	
Number of mills	[-]	5	1	4	0	0	1	
Capacity	[1.000 t/a]	1.600	530	1.510	0	0	100	
Importand production sites		Tunadal Gällö Munksund (Pitea)	Östrand	Ortviken Östrand Bollsta Tunadal			Nokia	
Captive terminals		Sundsvall, Umea						
Ports of shipment		Skövde, Rundvik Lugnvik, Bollsta, Piteä					Vaasa (70.000 t/a)	
Major ports of importation		Lübeck (Schlutup), Rotterdam, London, Dublin, Lissabon, Livorno						Since 2016 Kiel in place of Lübeck
Logistics division		SCA Logistics Sundsvall Agency agency.sundsvall@sca.com Direct: +46 60 19 36 68						
Contact logistics division		SCA Logistics AB Präsident: Magnus Svensson IT und Logistik: Roger Sälgh info.logistics@sca.com Direct: +46 60 19 35 00						
Web presence		http://www.sca.com/en/logistics						

SCA – Important port terminals

SCA-Terminal Sundsvall	London Tilbury (Berth 44)
	
Capacity: ca: 2.000.000 t/a Storage: ca. 70.000 m²	Capacity: ca: 550.000 t/a Storage: ca. 50.000 m²
RoRo und LoLo	
Feeder-Terminal (nearby)	
Terminal manager, Sundsvall urban.haggkvist@sca.com	Terminal manager, London steve.harley@sca.com
	london.logistics@sca.com

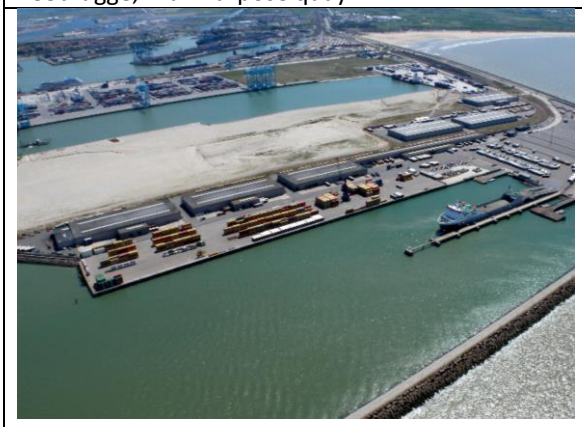
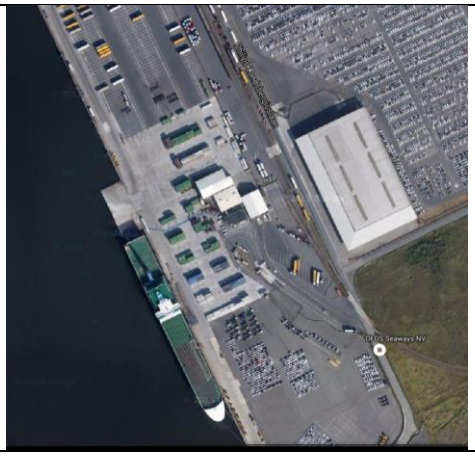
SCA-Terminal Rotterdam	Port of Umea
	
Capacity: ca: 1.600.000 t/a Storage: ca. 72.000 m²	Capacity: ca: 1.500.000 t/a Storage: ca. 75.000 m²
RoRo and LoLo	
Feeder-Terminal (integreted)	
Terminal manager, Rotterdam roelf.buist@sca.com	Terminal manager, Umeå margaretha.gustafsson@sca.com
rotterdam.logistics@sca.com	umea.logistics@sca.com

Annex 4: Stora-Enso group - overview of sea transport

Stora-Enso		Schweden			Finnland			Bemerkungen
	Dim.	Saw mill	Pulp mill (Market pulp)	Paper mill	Saw mill	Pulp mill (Market pulp)	Paper mill	
Number of mills	[-]	2	11		3	11		
Capacity	[1.000 t/a]	1.300	ca. 3.500		1.200	ca. 5.500		
Importand production sites		Ala (Ljusne), Gruvon	Kvarnveden, Skoghall Skutskar		Honkalathi, Ulimarhaju, Kitee	Imatra, Vaitsilouto, Oulu		Market pulp: Oulo, Kotka Sawnwood: Vaitsilouto 200 Tt?
Captive terminals		Ala(Ljusne), Skutskar				Vaitsilouto (Kemi)		
Ports of shipment		Gävle, Göteborg				Kotka-Hamina, Oulu, Rauma		
Major ports of importation		Zeebrügge			Lübeck, Zeebrügge (PSA WIELINGEN TERMINAL)			2014 from Antwerpen to Zeebrügge Ghent – Papierfabrik (pulp supply over Göteborg RoRo)
Logistics division	Stora Enso Logistics AB							
Contact logistics division	Berit Hägerstrand-Åvall Vice President, Sea Services +46 10 4615000 (landline) berit.hagerstrand-avall@storaenso.com							Stefan Sundin Vice President, Development +46 104615000 (landline) stefan.sundin@storaenso.com
Web presence								

Stora-Enso – Important port terminals

Veitsilouto, Kemi	Saw mill Ala (Ljusne)
	
Capacity: Storage:	Capacity: 500.000 t/a Storage:
RoRo and LoLo	
Feeder-Terminal (nearby))	
Terminal manager,	Terminal manager

Zeebrügge, Muli Purpose quay	Gent, DFDS - Terminal
	
Capacity: ca. 2.000.000 t/a Storage: 80.000 m²	Capacity: Storage:
RoRo and LoLo	RoRo
Container-Terminal (nearby)	
	Abfertigung SECU?
Terminal manager	Terminal manager,

Zeebrügge, PSA Wielingen-Terminal new

Annex 5: Holmen (Lundbergs) - overview of sea transport

Holmen		Schweden			Finnland			Bemerkungen
	Dim.	Saw mill	Pulp mill (Market pulp)	Paper mill	Saw mill	Pulp mill (Market pulp)	Paper mill	
Number of mills	[-]	2		3				
Capacity	[1.000 t/a]	900 m³		1.810				
Importand production sites		Iggesund Braviken		Braviken/Norrköping Hallstavik Iggesund/Hudiksvall				
Captive terminals		Hallsta, Braviken, Iggesund (Skärnäs Terminal)						
Ports of shipment		particularly Iggesund						
Major ports of importation				Kiel Rotterdam				
				hitherto Lübeck				
Logistics division		Christina Törnquist, Logistics Director						
Contact logistics division		Iggesund Paperboard AB SE-825 80 Iggesund Sweden / Sverige Phone: +46 650 280 00						
Web presence		https://www.holmen.com						

Holmen – Important port terminals

Hallsta Paper Mill and captive terminal Hallstavik	Captive terminal Braviken (near Norrköping)
	
Capacity: Storage:	Capacity: 500.000 t/a Storage:
RoRo and LoLo	
Feeder-terminal (nearby)	
Terminal manager,	Terminal manager

Lübeck, Schlutup	SCA-Terminal Rotterdam (also used by Holmen)
	
Capacity: ca. 2.000.000 Storage: 85.500 m²	Capacity: ca. 1.600.000 t/a Storage: ca. 72.000 m²
RoRo and LoLo	RoRo und LoLo
Seeland quay	Feeder-terminal integrated
Terminal manager	Terminal manager,