



## COMPETITION AMONG PORTS ON THE EASTERN COAST OF THE BALTIC SEA FOR THE RUSSIAN AND EASTERN EUROPEAN MARKET

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### **Abstract**

The paper describes the Baltic ports in the process of adoption to a changing environment. The EU is Russia's most important trading partner by far, accounting for 50% of its overall trade in 2010. This relation will continue to strengthen due to Russia's recent accession to the WTO (since December 2011). This paper aims to analyse the present economic situation in the ports on the East coast of the Baltic Sea with a qualitative analysis of their hinterlands. Since the ports on the East coast of Baltic basin are in a very competitive environment, it is interesting to investigate how they succeed in the attraction of Russian and Eastern European cargo.

**Key words:** competition, ports, Baltic Sea, Russian market, port throughput, hinterland

### **Introduction**

The growing trade volumes between the EU member states and Russia are supported by transport corridors (ex. Bothnian Corridor and Rail Baltica), which include the ports on the East coast of Baltic Sea (Barroso J.M., 2011). This relation will continue to strengthen due to Russia's accession in December 2011 to the WTO (Katainen, 2011).

There are quite a number of academic papers on Baltic ports developments, amongst others the paper of Notteboom (2010) where the concentration and the multi-port gateway regions in the European port system are analyzed. It was noted by the author that the Baltic ports have strengthened their traffic position during the examined period 1985-2008. Moreover, the net shift analysis applied in the paper confirm that ports of Baltic basin as well as the Hamburg–Le Havre range show significant positive net shifts, which can be interpreted that they gained more market share than other ports in the European port system (Mediterranean and UK ports had negative annual net shifts, which means that they are losing their competitive positions). The explanation of the North-German ports growth (from 14% market share in the late 1990s to 18.3% in 2008) is the recent volume growth of Bremerhaven and Hamburg ports. They acted as

hub ports for the feeder flows to the Baltic ports as well as gateway ports for the land-based flows to the developing countries in the East and Central Europe (Russia, Ukraine, Moldova, Belarus, Georgia etc.). Until recent times the connectivity of the Baltic ports to the shipping line's trade patterns mainly relied on the feeder services to hub ports in the Le-Havre-Hamburg range. However, the recent changes show Baltic ports are gaining a more independent role: port and terminal developments along with the changing design of the liner service networks confirm that. Notteboom (2010) noted that Baltic ports are gearing up to welcome more direct calls of mainline vessels. These ports have a good position to act as turntables for the Baltic on many trade lanes, the insertion of these ports as regular ports of call on the Europe – Far East trade remains uncertain.

All these observations prove that there are clear development processes taking place in the ports of the Baltic basin. An example of the Baltic ports market share and hinterland expansion is that approximately 120 000 TEU of Ukrainian import traffic was processed through Baltic ports in 2011, which represented 30% of Ukrainian import container volumes, and never entered the domestic ports in the Black Sea (Kuzmenko A., 2012).

The rest of the paper is organized as follows. In the first part a literature review on port competition is fulfilled. In the next section the methodology used is presented. A survey of ports in the Baltic Range is fulfilled in the third section. The following commodities are analysed in the survey: containers, dry bulk, liquid bulk, general and ro-ro cargo. In the fourth part of the paper, the future developments in the LNG market in the Baltic Range are discussed. In the final part, the conclusions of the paper are presented.

## 1. Literature review on port competition

Academicians frequently addressed the competition among ports in different regions of the world. Pallis et al. (2011) identified 40 papers dealing with the spatial analysis of the ports published since 1997. There are 34 academic papers identified by Ducruet et al. (2009) dealing with port system concentration published between 1963 and 2008. All these empirical studies accentuate that there are two main tendencies in port systems and ranges: some of port systems/ranges are becoming more concentrated and others are developing to a more evenly distributed system.

One of the classic studies on this issue is Taafe et al. (1963) which states an increasing level of port concentration as certain hinterland routes grow more significantly than others, which is a result of the increased importance of certain urban centres. The geographical system would evolve from an initial pattern of scattered, poorly connected ports along the coastline to a main network consisting of corridors between gateway ports and major hinterland centres. These developments can lead to the deterioration of secondary ports in the network.

The studies of Barke (1986) and Hayuth (1981) introduced a reversed process from Taafe's et al study (1963) which is the port system deconcentration. That process is caused by the growth of former non-hub ports and the emergence of new ports. Deconcentration within a port system is taking place when a part of cargo is being shifted from large ports to smaller or new ports. This process received the name of "challenge of the periphery" that has been analysed in a number of works (Hayuth, 1981; Slack and Wang, 2002; Notteboom, 2005; Fremont and Scope, 2007).

A new stage of port system evolution has been introduced by Notteboom and Rodrigue (2005), named port regionalization. At this stage inland freight distribution centres and terminals as active nodes in shaping the port development. The port regionalization phase is characterized by tight functional interdependency or even joint development of a specific port and multimodal logistics platforms in its hinterland. All these dynamics ultimately leading to the formation of a "regional load centre network".

Additional models on port system development underline the role of political and institutional factors. Recent port evolutions are significantly influenced by governance models, port reforms and regulatory frameworks (Jacobs, 2007; Wang, 1998; Airriess, 2001; Brooks and Cullinane, 2007).

Concluding the described theoretical models on port system dynamics we can definitely state that port evolution is a very complicated process, which has to be assessed from multiple angles. This paper aims to analyse the present economic situation in the ports on the East coast of the Baltic Sea with a qualitative analysis of their hinterlands. Moreover, determine which ports on the East coast of Baltic basin are more successful in attraction of certain types of commodities and more specific which ports are foremost outstanding in the attraction of Russian and Eastern European cargo. The research question is: Is the cargo dedicated to/from Russia and Eastern Europe highly concentrated in few ports or dispersed in numerous ports?

## 2. Methodology

The ports in following countries are addressed in this paper: Poland (Gdansk, Gdynia), Russia (Kaliningrad, Ust-Luga, St. Petersburg, Primorsk, and Vysotsk), Lithuania (Klaipeda), Latvia (Riga, Ventspils, and Liepaja), Estonia (Tallinn, Silamae) and Finland (Hamina, Kotka) (fig.1). For ease of reference, these ports analyzed are referred to as “Baltic Range”. The commodities analysed in the current paper are as follows: containers, general cargo, dry bulk cargo, liquid bulk cargo, ro-ro and LNG.



**Figure 1.** Baltic Ports on the East coast

Source: <http://www.baltictransportoutlook.eu/>

Because each commodity has its peculiarities and specifications in terms of market players, market dynamics etc., the analysis of Baltic Range will be based on each separate commodity type. The methodology used was statistical data analysis (ports' cargo traffic growth rates along with ports' commodity structure) and market concentration measures (market shares and Herfindahl–Hirschman indexes). The total market size considered for the concentration

measures, was the sum of all the Baltic Range ports for each separate cargo type. The current analysis was limited to the period between 2010-2011, in order to give a present overview of the ports' position for certain cargoes. The Herfindahl–Hirschman Index was calculated as:

$$H = \sum_{i=1}^N s_i^2 \quad (1)$$

where  $s_i$  is the market share of port  $i$  in the certain commodity market, and  $N$  is the total number of ports active in handling of that commodity type.

The hinterland served by Baltic Range was analysed qualitatively (from the origin – destination perspective) and quantitatively (in th. tons, where data was available), along with hinterland connections' qualitative analysis to respective ports.

Preliminary results of the cargo concentration analysis are presented bellow in the table 1. First of all it is worth to mention that each commodity analysed is processed in different number of ports (e.g. ports involved in liquid bulk handling are 14, on the contrary ports involed in container handling are only 10). The concentration index HHI shows that more evenly distributed cargoes among the Baltic Range are dry bulk and ro-ro cargoes (with HHI-s 0,12 and 0,15 respectively). Most concentrated cargoes during both periods (2010-2011) are liquid bulk, containers and general cargo (with HHI-s 0,19; 0,24 and 0,16 respectively in 2011).

**Table 1.** Concentration level of Baltic Range ports in 2011

Commodity type	Number of ports	Normal concentration level (1/n)	HHI 2010	HHI 2011
Containers	10	0,10	0,25	0,24
Liquid bulk	14	0,07	0,20	0,19
Dry bulk	13	0,08	0,12	0,12
Ro-ro	11	0,10	0,15	0,15
General cargo	12	0,08	0,15	0,16

Source: Authors compile

### 3. Survey of situation of the ports in the Baltic range

#### 3.1 Gdansk/Gdynia (Poland)

The operational results of Polish ports in 2010 and 2011 are quite different. The overall annual throughput of Polish ports in 2010 grew by 30%, but in 2011, it was not the case. The ports' throughput slightly decreased by 0.01%. One of the big decreases in 2011 that influenced the Polish ports' performance overall, was the port of Gdansk throughput decrease (almost by 7% in comparison with 2010). There is a clear tendency that the Russian cargoes are leaving the Polish ports. There was already a warning before that would happen, and so it did. Where in 2010 half of the crude oil handled in the ports had Russian origin, in 2011 it dropped to 41%. This tendency seams to continue due to the start of operations in Ust-Luga port in Russia since January 2011 (appendix 3). The Northern port in Gdańsk is responsible for 85% of national liquid cargo handling, therefore the negative changes in Gdańsk (866 000 t.) had to result in a general decrease of the port market share. An interesting phenomenon concerning this segment of cargo was the shifts in the direction of service direction – the dominant re-export of Russian resources through the Northern Port is beginning to be balanced by import relations (Matczak, 2010).

General cargo mutual market shares of Gdansk and Gdynia are quite insignificant (3,8%). More over the growth rates are negative (-49% and -11% respectively). These facts show that for this commodity Polish ports are losing market position. The origin/destination of these cargoes are mainly Poland and the neighbouring countries (Germany and two land locked countries of Slovakia and Czech Republic).

Since January 2010, Deep-water Container Terminal (DCT) Gdansk revolutionized the Baltic Sea market by becoming the first hub port handling transshipment volumes to Russia and Finland in addition to Polish import and export volumes. According to a report from Ocean Shipping Consultants Ltd, DCT Gdansk provides very substantial cost savings to Lines that use it as a hub to serve Russia and other Baltic Sea destinations. This is due to multiple factors, such as ice free port, lower handling fees and port costs, and short turnaround times. Gdansk is seen by its port authority as a hub for Central and Eastern Europe and for Russia (appendix 1). The overall market share of Polish ports in container handling in 2011 reached 24 %.

Dry bulk market position of Polish ports is stable, their mutual market share of almost 14% together with its moderate positive growth rates proof a positive trend. Both ports handle almost half of all domestic coal exports and all of its iron ore imports.

Ro-ro cargoes handled here are designated for Finland and Russia mainly (personal cars). Free economic zone in the port allows to do the additional pre delivery inspection (PDI) services for the cars and not to pay taxes on handled cars. Another part of the car volumes were designated for Lithuania, Ukraine, Latvia and Hungary. As the market concentration analysis shows that for this commodity Polish ports (especially port of Gdynia) have strong position with a mutual market share of 15%.

### **3.2 Kaliningrad, Ust-Luga, St. Petersburg, Primorsk, Vysotsks (Russia)**

The largest share of all cargo flows in the Baltic range is transported via Russian ports. (appendices 1, 2, 3, 4, 5). In 2011 the Russian ports at the Baltic Sea increased their handling volume by 4,8 % up to 185,7 million tons. Dry bulk accounted for 72,0 million tons (+13,7% yoy and market share of 27%), liquid bulk 113,7 million tons (-0,2% yoy and a market share of almost 60%), container reached 4,63 million TEU (+28,5% yoy). One can conclude that the Russian Baltic ports maintain their 50% market share for containers in Russian ports (appendix 1). The general cargo traffic shows a concentration tendency in Russian ports (mutual yoy of 6,4% and market share of 55%). For ro-ro cargoes Russian ports start to play a more significant role than before, though the mutual market share is not yet dominant (20,8%), they have a significant growth rate (average yoy 67%).

Changes in container traffic in 2011 are amongst others related to the establishment of Customs Union between Russia, Belarus and Kazakhstan: a tendency is being observed of a reorientation of the container traffic with China's import cargo through Russia, to Kazakhstan. Kazakhstan is neighboring on on China, notwithstanding that Kazakhstan has common borders with China. This is an indication that shipping oversea for smaller volumes is still less expensive than rail transport over land, in this particular case.

#### ***Kaliningrad***

Kaliningrad is the southernmost Russian port in the Baltic Sea region. In 2011 the its cargo turnover reached 13351,2 th. t., the year-on-year change was -3,2 % (446,2 th. t.). The significant decrease was due to oil product handling (decreased by 20,2 % in comparison with 2010), its turnover reached 4 665,1 th. t. (appendix 3), meanwhile cargo handling in Ro-Ro cargo increased by 111,6 % (554,7 th. t.) up to 1 051,8 th. t. (appendix 5). Analysis of cargo structure indicates that oil and oil products (43,4% of overall turnover), metal (11,1 % of overall turnover), containers (9,5 % of overall turnover), and Ro-Ro cargoes (7,9 % of overall turnover), vegetable oil (2,0 % of overall turnover) constitute the biggest share of cargo handling.

Kaliningrad suffers obviously from its geographical and geo-political position as an enclave amid EU member states Poland and Lithuania.

### ***Ust-Luga***

Ust-Luga is situated at the western part of the Finnish Gulf, close to Estonia. Ust-Luga is the port with the best nautical access among Baltic Russian Ports, given its draft and given its shortest period of ice cover. Ust-Luga seaport is for the time being the Russian federal priority project on handling capacity development of Russian ports in the Baltic Sea region. A high class rail connection and improved road connection is in place, and guarantees connections to all over Russia. Every year the development and growth rates are increasing and cargo flows transported via the ports of Russia are gradually changing; a significant share of cargo flows has been directed namely to the Port of Ust-Luga. In 2011 the port marked an impressive increase of 92,7% in overall turnover, and reached the annual volume of 22 693,0 th. t. The basic cargo categories are coal and oil products (appendices 2 and 3). They constitute 83,2 % in the overall throughput of the Port. The coal volumes handled in 2011 reached 12417,1 th. t., an increase of 38,9 % (3 474,9 th. t.). Analyzing the changes of cargo flows it is possible to make the assumption that the biggest share of this increase occurred from coal handling that has been transferred from the Port of Saint Petersburg to the Port of Ust Luga. The handling of oil products in the Ust Luga started only in 2011 and constituted 28,5% (9478,2 th. t.) in overall turnover, but is expected to witness a sharp increase due to the start-up of the BTS-2 pipeline.

### ***Saint Petersburg***

Saint Petersburg port throughput in 2011 was 59 960,0 th. t., showing a the year on year increase of 3,0 %.

The largest share in this throughput consists of container cargo (36,7 % of overall cargo turnover). The turnover of container handling was 21 978,0 th. t. (15,7 % yoy), with its terminals Moby Dik, Petrosport, First Container Terminal, and others. Expressed in TEU the turnover reached 2 365 174 TEU in 2011, showing an impressive year-on-year increase of 22,5 % (appendix 1).

The rationale for the strong position of Saint Petersburg as a container port vis-à-vis other Russian Baltic Ports is mainly driven by the fact that Saint Petersburg has a strong consumer base (over 4 million people), and that it is the traditional Bill of Lading for the whole Northwest region and Moscow cargo. Container handling during the first half of the years 2000 used to be quite complicated due to (i) lengthy custom procedures, (ii) low performance of the container terminals and (iii) very long traffic lines through Saint Petersburg. This resulted in very high demurrage and working capital costs for the shippers. During the last 5 years however, the stevedores in Saint Petersburg have set-up inland extended gates South of Saint Petersburg (such as Yanino). Also the stevedores have invested in expansion and increased performance of their container terminals.

Next to container handling the significant share in the turnover of the Port of Saint Petersburg is occupied by oil products (26,1 %, in overall turnover; the total throughput in 2011 was 156714,3 th. t., the year-on-year change was -3,9 % or -627,9 th. t.), metal (10,4 %, in overall turnover; the total throughput in 2011I was 6 264,4 th. t., the change was + 1,7 %, or + 102,2 th. t.) and fertilizers (10,1 %, in overall turnover; the total throughput in 2011 was 6 036,2 th. t., yoy -0,6 % or -36,3 th. t.).

Saint Petersburg has a relatively complicated nautical access. During winter time it is confronted with the longest ice cover. Moreover, the 40 km long access channel has a single direction convoy system for shipping traffic.

There is a major expansion project ongoing in the Neva Bay. Just at the start of the shipping channel to Saint Petersburg, currently a facility is being constructed near the village of "Bronka". This facility would ultimately have a capacity of over three million TEU and one

million Ro-Ro units. Given the shallow waters in the Neva Bay however, the project is connected with very high dredging costs, for which no federal budget is allocated yet. On the other hand, this project is a logic choice

#### ***Primorsk***

According to handling capacity the Port of Primorsk is one of largest in the Baltic region, but it is dedicated exclusively to the export of Ural crude oil and oil products (appendix 3). In 2011 the throughput of these products dropped by -3,2 % ( by 2515,4 th. t.) to 75 124,6 th. t. The handling volumes of the crude oil constituted 93,3 % of overall Port handling turnover. 70 126,5 th. tons (-2,4 % or - 1 704,6 th. t.) of crude oil were handled in the Port of Primorsk in 2011. The handling rates of oil products in 2011 dropped down by 14,0 % (810,8 th. t.), till 4 998,4 th. t.

Primorsk's position as a crude oil export facility is obviously directly connected with the Transneft pipeline ending there (BTS-1).

#### ***Vysotsk***

Vysotsk is situated on the Northwest part of the Finish Gulf, not far from the Finnish border, relatively distinct from populated areas. Vysotsk port is dedicated for two commodities: oil products and coal (appendices 2 and 3). In 2011 the cargo handling turnover was 13 422,1 th. t., a decline with 9,6 % yoy. Oil products represent 76,1% in overall turnover of the Port (10 220,3 th. t.) in 2011 (-23,9 % yoy). The turnover of coal represented 3201,8 th. t. (+27.7% yoy). The rise in coal handling is driven by the recent upgrade and expansion of the coal port in 2010.

Vysotsk has a good rail connection, and all its export cargos are delivered by rail from mines all over the Russian territories.

It shall be noted that the nearby historic port of Vyborg has a negligible existence. Indeed, the nautical access to Vyborg is quite complicated through a long access channel, and the handling facilities and berths are outdated and degraded. The company which took control over the port in 2006 went in bankruptcy.

#### ***Summary***

One could summarize following structure of Russian Baltic Ports:

- *Kaliningrad* is not directly connected to other Russian Baltic ports; it is an enclave port amid EU member states though it has a significant market share in containers (almost 6%), in general cargo (about 14 %) and in Ro-ro (bout 8%).
- *Ust-Luga* is the port with the best nautical access and is the priority project in the Russian Federation. Ust-Luga takes increasingly cargo away from Saint Petersburg. Ust-Luga is successful in attracting the dry bulk traffic (almost 14% market share) and liquid bulk (3,3 %).
- *Saint Petersburg* maintains a strong position as import port for consumer products (containers market share reached almost 44% in 2011) but loses typical domestic export cargoes like dry bulk and steel products to other ports. It is expected that Saint Petersburg, including the ongoing expansion plans, will maintain a strong position as import port for Russian consumption.
- *Primorsk* is a dedicated Ural crude export facility
- *Vysotsk* is a dry and liquid bulk products export facility, relatively far from populated areas.

### **3.3 Klaipeda (Lithuania)**

Lithuania has basically only one port, Klaipeda, while other Baltic States, have several ports. Butinge is the Single Point Mooring oil terminal (SPM) at the distance of 7,5 km up North along the coast line. From the viewpoint of competitiveness Klaipeda competes only with the ports of other countries in the East Baltic Sea. Due to significant differences in the railways tariffs from Russian rail to Russian ports vis-à-vis ports in neighbouring EU countries, the attempts of other countries to fight for cargo flows are challenging. In 2011 Klaipeda Port was the port that handled the largest volumes of cargo compared with other Baltic States seaports

and pushed its ranking in the Baltic range from fourth to third. However, it is necessary to keep in mind that Primorsk port, which handled the largest share of all cargoes in the range (38.4% of Russian oil export – see appendix 3), had been constructed as an export facility for exclusively Russian crude oil. Therefore, this type of cargo in terms of competition made no impact on Klaipeda market.

The throughput export/import ratio in the period of 1991-2011 cargo exported via Klaipeda Seaport constituted 75% / 25%. This is due to Lithuania's geo-economical position. Lithuania has common borderlines and good transport connections with industrialized countries that are rich in resources, sell raw material, and manufactured goods to the international market.

### *Transit flows*

The important East-West transport **corridor IXB** connects Klaipeda, Kaunas (Lithuania), Vilnius (Lithuania), Minsk (Belarus), Kiev (Ukraine), Moscow and the rest of Eastern Europe. About 90% of the transported cargo on this corridor (import and export) is via railway. This is one of the most important transit cargo flows to and from Russia. Another important corridor is **Corridor I**, crossing Lithuania from North to South. Corridor I comprises the Via Baltic motorway (connecting Estonia, Latvia, Lithuania, Poland), and is therefore less suitable for Russian cargoes (Žymantas Sinkevičius, 2012).

Lithuanian ports are less used for Russian exports than other Baltic ports, due to the lack of a direct border between Russia and Lithuania, except for the Russian enclave Kaliningrad; in order to get to the Lithuanian port, the Russian cargo shall cross a third country's territory, Belorussia or Latvia. This is one of the main reasons why the share of Russian cargo in ports of Lithuania is less than in other Baltic states' ports.

In 2011 transit cargo constituted 44,4% of total Klaipeda volumes. The cargo dedicated to or from Belarus (31,4 %) and Russian cargo (10,5 %) made the greatest impact on the overall transit cargo turnover via Klaipeda Port. Transit cargo from other countries constituted the remaining 2,5% of total cargo turnover: Latvia 0,8 %, Ukraine 0,6 %, Kazakhstan 0,6 %, Uzbekistan 0,1% and Estonia 0,1 % (Dvorak, 2008).

Nowadays Klaipeda Port is the first port in the Baltic range for export from Belarusian industries. In 2011 the turnover of Belarusian cargo increased by 41,4 % compared with 2010. However strongly decreasing, oil and oil products constituted the largest share of Russian cargo flow, totally 1212,8 th. t. (-34,7 %, yoy) were handled. Fertilizers increased by 1,6 % (appendix 2). The handling of ferrous metal (including scrap metal) accounted for the most significant increase of Russian cargo flows via Klaipeda Port. In 2011 nearly 921,5 th. t. (+460% yoy) were handled. This change was determined by the handling volumes of iron ore briquettes, the handling of which started in Klaipeda Port in December of 2010. (Žymantas Sinkevičius, 2012).

Cargo flows from Ukraine and Kazakhstan in the overall cargo handling turnover of Klaipeda Port constituted a small share. The largest flows from (to) Ukraine were detected in the categories of food products and fodder, timber and ferrous metals and the basic cargoes delivered from Kazakhstan.

### *Volume analysis*

In overall Klaipeda port turnover volume in the most important handling shares of cargo types were of fertilizers 31,7 %, oil products 25,0 %, Ro-Ro cargo 13,4 % (-0,4 % yoy), containerized cargoes 11,7 % (+0,4 % yoy).

#### *Fertilizers*

Klaipeda port is very competitive for the handling of fertilizers in comparison with ports in neighboring countries. The export of fertilizers produced in the plants located in Belarus via the Seaport of Klaipeda in 2011 was 7064,2 th. t., the increase was 34,7 % yoy (appendix 2). The flow of fertilizers produced in Russia via Klaipeda Seaport remained rather intensive in 2011 and accounted for 1 249,0 th. t., with a moderate growth of +1,6% yoy. The export of the remaining part of fertilizers was attributed to the production of the industry of Lithuania.

Fertilizer volumes started growing rather impressively somewhere in the middle of 2009 (Žymantas Sinkevičius, 2012).

#### *Oil products*

The turnover of oil products in Klaipeda Port has stabilized since 2009 (appendix 3). The share of oil products destined for export was 97,5% (for The Netherlands –Rotterdam- and the USA). Analysis of transportation of export - oriented oil products produced in Belarus by railways to the Port of Klaipeda demonstrated the rapid growth. In 2011 the throughput of Belarusian oil was 2 484,5 t. tons, i.e. more by +93,5 % year-on-year. The transshipment of oil products from Russia dropped to 1 212,8 t. tons, i.e. less by -34,7 % year-on-year. Nearly 1/2 of oil product exportation via Klaipeda Port constituted the production of the petroleum refinery company "ORLEN Lietuva" located in Mazeikiu region (Žymantas Sinkevičius, 2012).

#### *Ro-Ro*

In 2011 the increase of the throughput of Ro-Ro cargoes was 14,0 % (+32 101 units), the overall turnover represented 326 196 units (appendix 5). The maximum cargo turnover is reported between the ports of Germany, Sweden and Denmark. 53,9 % of Ro-Ro cargoes arrive to Klaipeda Port and 46,1 % are transported from the Port (export).

#### *Containers*

In 2011 the container turnover in Klaipeda Port was 382185 TEU, the year-on-year growth was an impressive +29,5%. Since July of 2011 dramatically increased import dues imposed on used cars imported to Belarus, Russia and Kazakhstan triggered the alternative way of used cars import by containers from the USA. After this impressive increase the market has stabilized within the following several months. In 2011 a marginal amount of 10784 TEU (2,8% share) were transshipped to other ports (appendix 1).

### **3.4 Riga, Ventspils, Liepaja (Latvia)**

The share of the ports of Latvia in the overall cargo flows of the Baltic range constitutes about 20,11 %. Riga is located at the innermost side of the Bay of Riga and is amid the major consumer base in Latvia (one million inhabitants in Riga on a total Latvian population of two million). During severe winters, the Bay of Riga is covered with ice. Ventspils is located at the seacoast, just at the southern ending of the Bay of Riga. It has a very central location in the Baltic and is ice-free. In the South at the seacoast, immediately near the Lithuanian border is the former Navy port Liepaja. Liepaja has a very good nautical accessibility, but is quite far from Latvia's main centres on the one hand, and is very close to Klaipeda, its prime competitor, on the other hand.

#### ***Riga***

During USSR times, Riga used to be the prime Northwestern port for the USSR. Therefore, Riga is still very well connected to the Russian railway system. Riga is geographically the closest port to Moscow, and suffers much less icy conditions than Saint Petersburg.

It is important to add a cultural note to this paper. In Riga, over 60% of the population is ethnic Russian or Ukrainian and speaks Russian as a mother tongue. Therefore, notwithstanding the revolution and subsequent independence in the early 90's, there are strong ties also in business between Riga and Russia. Many investors in Riga have Russian capital involved. Apart from the good location and rail connectivity, therefore, also the strong business connections serve that Riga continues to be an important port for Russian cargo, notwithstanding the disadvantage of the EU-Russia border crossing.

In 2011 the cargo handling turnover in the Port of Riga reached 34 072,1 th. t. (+ 11,8 % yoy). The largest increase was reported in coal handling (mainly because of severe winter in Russia), the change of dry bulk cargoes traffic comparing to 2010 was 15% yoy with a market share of 21%. The handling volume of oil products constituted 7 518,9 th. t. (15,1 % yoy and market share of 4%). The most dramatic decrease in 2011 was reported in the turnover of timber

and forest products (appendix 4), the handling volumes of general cargo dropped (-4,2 % yoy and market share of 11,1%). In 2011 coal proved to be a dominating commodity (39,6 % in overall port turnover, and 21,3 % market share in the Baltic range ports), as well as oil products (22,1 % in overall port turnover), timber and forest products (11,7% in overall port turnover), and containers (9,3% in ports overall traffic). Fertilizers (5,0%) constituted the smallest share of the overall turnover of the Port of Riga.

### ***Ventspils***

The Free Port of Ventspils in 2011 reached the throughput volumes of 28452,0 th. t., (+14,7 % yoy). Analysis of cargo structure showed that in 2011 the largest share was occupied by oil products (50,8 % in overall port turnover) and coal (23,3 % in overall port turnover) (appendices 2 and 3). In terms of the commodity, type the most impressive change in 2011 was in coal handling 6616,0 th. t. (+80,5 % yoy) and in oil products 14458,0 th. t. (+8,2 % yoy). Given its relatively long distance to the hinterland, Ventspils indeed shows a low or negligible volume of general cargoes or containers (appendices 4 and 1) and proves to serve mainly extracting industries with significant market shares of dry and liquid bulk (11,2% and 7,7% respectively).

### ***Liepaja***

Liepaja is the smallest port from all analysed ports of Latvia according to the port throughput. In 2011 the sea born cargo turnover of the port reached 4856,9 th. t., the yoy increase was 10,8 % (473,1 th. t.). Grain represented the biggest share in the overall turnover of the port in 2011 (appendix 3). The handling turnover of grain, (coming from Russia, Kazakhstan, Ukraine, Byelorussia and Baltic States, such as wheat, barley, rye, sunflower seeds, sunflower seeds meals and cakes, beetroot meals) reached 1446,1 th.t. (by 2,4 % more than in 2010). Other commodities are mainly wood and forest products export from domestic production from Latvia's vast forests (market share of general cargo constituted 6,1%, see appendix 4).

## **3.5 Joint Port of Tallinn, Port of Silamae (Estonia)**

### ***The Joint Port of Tallinn***

The Joint Port of Tallinn encompasses 5 ports (Muuga, Paldiskis, "Old City", Saaremaa, Paljessaare), all these ports are managed by one state port authority. In 2011 the overall turnover reached 36467,1 th.t., a small decrease of 0,5 %

The cargo flow via the ports of Estonia, i.e. the Joint Port of Tallinn, constitutes about 10,89 %, of the overall cargo flow in the Baltic range (appendices 1,2,3,4,5). The Joint Port of Tallinn is dramatically affected by the tendencies of the development of Russian ports as it is in close vicinity to all 6 ports of Russia, and especially the new development in Ust Luga. Therefore in case of emergency of political or economic tension the cargo flows may be very easily re-oriented from the ports of Estonia to the ports of Russia.

Oil products represent the largest share in the overall turnover (69,1 %), the turnover in 2011 reached 25 211,5 th. t. (+1,9 % yoy). For the Baltic Range level Tallinn counted for a market share of 13,4%. The Oil Products Terminal in Tallinn handles exports of Russian, Belorussian and Kazakh fuel oil and light oil products. It operates four modern terminals with the total storage capacity of 1,026,000 cubic meters, of which some 75% can be heated and used to store dark oil products. The main customers are TNK-BP (Russian-UK), IPP, Gazprom neft, Chevron, Gunvor (Russian), Taneko and others. Tallinn can hold its position quite well, thank to these specialized facilities, its high level of customer focus and strong customer base.

The handling of Ro-Ro cargoes increased to 3690,3 th. t. (4,4% yoy). The market shares of ro-ro cargoes counted for 23,1 %. Fertilizers cargoes constituted 4,9 % (dry bulk market share of 4,4%) and containerized 4,2 % (container market share of 3,7%) in overall turnover. In 2011 the handling volumes of fertilizers reached 1804,2 th.t. (10,4 % yoy) (Žymantas Sinkevičius,

2012). The handling volumes of containerized cargoes reached 1527,1 th. t (+17,8 % yoy). These volumes reflect mainly domestic demand.

The most impressive decline was reported in coal handling, the turnover dropped from 1 453,6 th. t. in 2010 to 344,7 th. t. in 2011 (-76,3 % yoy). This is due to the increase of coal handling capacity in the Russian ports of Ust Luga and Vysotsk

### ***Sillamae***

Total throughput of the Sillamae port in 2011 was almost 5 mln t. It is the most Eastern port of the EU. Sillamae is located only 25 km from the EU-Russian border and, hence, can serve as an efficient platform for the distribution of goods to neighbouring markets of: Russia and the CIS in the East, Scandinavia and the EU in the West. It is an all year-round navigable deep-sea multifunctional. Port of Sillamae is privately owned port and has Russian capital.

There are four terminals operating in Silamae at the present time:

- Alexela Sillamäe – oil products and bunkering;
- Tankchem – liquid petrochemicals;
- Silsteve – general, conventional and oversized cargo;
- Baltic Chemical Terminal - terminal for handling liquid fertilizers.

### **3.6 Hamina and Kotka (Finland)**

The Port of HaminaKotka Ltd launched operations in May in 2011, following a merger between the ports of Kotka and Hamina. Since the collapse of the USSR, it is the foremost Finnish ports for Russian trade. The ports also used to be an almost exclusive import point for cars for the Russian market, as a consequence of the lack of qualitative Ro-Ro import terminals in the Saint Petersburg area. During the last few years however, Saint Petersburg has noticed the start of organized and qualitative import facilities, a.o. “Russian Transport Lines” (Saint Petersburg old fish port, and Ust-Luga “Vistino”).

The ports of Kotka, Hamina and partly Helsinki, which lie near the Russian border, are primarily for Russian import cargoes, their entire cargo is transported in an easterly direction. The commodities consist primarily of containers, Ro-ro and forest products, and liquid bulk. More than 15 mln. t. of goods are carried annually through this twin port, primarily to St Petersburg, Moscow and other parts of Russia. In addition, the port is naturally one of the main ports for the exports of the Finnish forest industry.

The container terminal in Haminakotka (1.0 mln TEU annual capacity) mainly serves Russian imports and Finnish export cargo flows. The Finnish ports have good road and rail connections in Helsinki and Kotka (A. Astapov 2012), and the gauge system is the same like in Russia.

The containers contain mainly high value imports for the Russian market, which are onward transported to Russia by truck. For high value goods, Finish ports were preferred to evade lengthy custom procedures and to avoid too long dwell times in the Port of Saint Petersburg (working capital drain). However, also on the Russian road border stations between Finland and Russia, trucks had reportedly to queue very long times and on the other hand the container terminals in Saint Petersburg became more performing. The latter is especially induced by the set-up of inland extended gates South of Saint Petersburg, such as Yanino.

Every year approximately 95–100 % of the transit volume of chemicals has been Westbound transit cargo and only 0–5 % East-bound transit cargo. In the year 2010, the export of chemicals in Finnish ports accounted for 3.4 million t. (55 % of chemical throughput) and the import of chemicals for 2.8 million t. (45 % of chemical throughput).

In short, it can be stated that Kotka and Hamina are suffering from the new qualitative facilities in Saint Petersburg, which claws back Russian cargo to the Russian ports. Noteworthy is that 75% of the shares in the stevedores MLT Kotka and MLT Helsinki (Vuosaari) is held by Russian N-Trans group. N-Trans is also controlling Global Ports International, the group

owning Petrolesport the container, Ro-Ro and general cargo operator in Saint Petersburg, and Moby Dick container terminal (Kronshtadt, just at the entrance of St Petersburg fairway).

#### 4. LNG market in the Baltic Range

During the last decade, LNG ports and shipping have become a substantial topic in maritime industry all over the world, and more in particular in the region discussed in this paper. Many (Eastern) EU countries want to get less dependent on Russian gas and therefore want to tap from the international LNG market to secure their supply of gas. At the same time, the future scenarios indicate that the gas consumption of the EU increases due to a closure of some nuclear power stations and the reduction of the use of environmentally polluting energy sources such as coal (Kari, 2012).

The future plans concerning the LNG terminal construction in ports of Baltic Sea are following in the text bellow and in the table 1.

**Table 2.** Some major LNG liquefaction plants and regasification terminals in the Baltic Sea

Country	Name & location	Annual capacity (bcm)	Status
Denmark	No existing LNG plants or terminals - no information about plans to build a major LNG unit		
Estonia	Paldiski LNG terminal (50 km west of Tallinn)	2.5-3.0	Planned (in operation 2015)
	Muuga LNG terminal (Tallinn)	3.0	Planned (in operation 2016-2017)
Finland	Porvoo / Inkoo LNG terminal (50 km of /60 km of Helsinki)	Up to 2.0	Planned (in operation 2015-2018)
Germany	Wilhelmshaven LNG term. (1&2)	16.0	Suspended
Latvia	Riga LNG terminal	2.0	Planned
Lithuania	Klaipeda LNG terminal (300 km north-west of Vilnius)	1.0-3.0	Planned (in operation 2015)
Norway	Snehvit LNG plant (connect to the Melkoya Island with a 160- km-submarine pipe)	5.8	On stream since 2007
	Risavika LNG plant (close to Stavanger)	0.4	On stream since 2011
	Kollsnes LNG plant (1 & 2)	0.2	On stream since 2003
Poland	Swinoujscie LNG terminal (close to Szczecin)	2.5-5.0 with upgrading potential to 7.5 by 2020	Under construction (in operation 2014-2015)
Russia	Baltic LNG plant (Primorsk 100 km north- west of S1, Peters- burg)	2.0 (downsized from original plan of 6.8-9.8. bcm)	Cancelled by Gazprom in 2008, acquired by Sibur (Novatek) in March
Sweden	Brunnsviksholme LNG terminal (Nynasharnn)	0.4-0.5	On stream since 2011 (onshore)
	Gothenburg LNG terminal	0.5	Planned (in operation 2013-2015)

Source: Stenkvis 2011

Both the conventional natural gas reserves and gas production in the Baltic Sea region (BSR) are small on a global scale if we do not include here the region's non-EU members, namely Norway and Russia. The BSR countries, excluding Norway and Russia, possess together less than 500 bcm of conventional natural gas (BP 2012).

Norway and Russia belong to a completely different category than the rest of the BSR states. Norway's conventional natural gas reserves are approximately 2000 bcm and those of Russia around 45,000 bcm, making Russia's gas reserves the world's largest. Norway's unconventional reserves are probably relatively small, but Russia holds very significant unconventional gas reserves - at least 10,000 bcm.

- Gasum's plan to construct a major LNG receiving terminal in Finland seems realistic as long as Gazprom does not start to slow down the project from within the firm. Here it needs to be underlined that Gazprom owns a quarter of Gasum and may influence decision-making of Gasum's main owner (Fortum) via its gas supplies to the company's electricity generation units in the Urals. Gazprom/the Russian Government may consider that there is a conflict of interests between the proposed LNG terminal and Gazprom's gas pipe deliveries to Finland. As there is no clear understanding of Gazprom's real motives, it is impossible to predict the final size and timetable of this unit despite detailed plans. Should the terminal reach the proposed 2.0-bcm-capacity, then it could have a major impact on diversifying Finnish gas imports. In addition to this major terminal, Finland will build a small scale unit to bunker LNG ferries and ships in South West Finland.
- Germany may prefer to build additional pipes from Russia rather than construct LNG receiving terminals. Germany and Russia last year completed the Nordstream pipeline over the Baltic sea bed, connecting Primorsk (Russia) with Greifswald (Germany). Even if Germany would decide to build a small scale LNG terminal in Rostock, it does not have a major impact on the gas diversification of the country, since the terminal would meet less than 2-3 percent of Germany's total gas consumption.
- Lithuania has progressed most among the Baltic States with its LNG receiving terminal. The keel for the Floating Storage and Regasification Unit was laid in Summer 2012. It has been declared to open the first LNG terminal in the Baltics already at the end of 2014, though most probably the terminal will be opened during 2015 due to a slight delay.
- Latvia's LNG project is still in the development stage. It will anyhow be postponed from the original plan. Furthermore, the downgrading of the project seems inevitable as a common Baltic project does not seem to materialize, and Klaipeda is moving ahead.
- Estonia will host only one major LNG terminal. It is believed that the project proposed by the Estonian state will go forward. Most probably, the size of this terminal will be smaller than indicated in the plans, to a capacity of around 1.0 bcm. It is estimated that the LNG facility will be operational by the end of this decade.
- Poland plans to open its LNG terminal in Swinoujcie near the German border in 2014. The construction is progressing well.
- Russia: Sibur, a subsidiary of Novatek, plans to build a plant with a nominal capacity of 2.0 bcm. The location of the Baltic LNG plant would be located in Primorsk, the Leningrad region, close to the Finnish-Russian border. It can be estimated that this terminal could be operational by 2018. This project will proceed if the Russian Government considers that Novatek would not start to compete with the pipeline deliveries of Gazprom through the Nordstream pipeline. In other words, this would mean that Sibur's main clientele would be outside Europe. In addition to this plant, Sibur plans to erect a liquefied petroleum gas unit in Ust-Luga, in 2013.

## Conclusions

From the executed survey on Baltic Range ports we can draw out following conclusions. For the analyzed period of 2010-2011 Baltic ports showed to experience concentration dynamics. Especially that stands for commodities like: containers, liquid bulk and general cargo. For containers market the ports that attracted most of the traffic were Polish ports and Russian ports (with 74% of total container traffic in the range). Liquid bulk market is clearly dominated by Russian ports (market share of 58%), at the same time the ports of Lithuania, Latvia and Estonia show similar values of market shares around 10% each. For the general cargo market the biggest concentration is taking place in Russian ports as well (mutual market share of 56%) followed by the Latvian ports (mutual market share of almost 21%). The concentration processes

that are taking place in the Baltic Range for these commodities caused some losses of cargo volumes for specific ports. In port theory this process is defined as “challenge of the periphery”, which can be applied to the current study case. Finnish port of Hamina struggles with this phenomenon. The growth rates of Hamina for the above mentioned cargoes are either zero or negative, and the market shares are not important. Remarkably that the Russian port of Kaliningrad develops according to its own path, different from the other domestic ports. Being isolated from the main land of Russia it starts to play a less significant role in the liquid bulk market respectively also suffers from “challenge of the periphery”.

Dry bulk market is the less concentrated among all the commodity markets currently analysed. Never the less we can state two ports suffering from the “challenge of the periphery”. One of them is Tallin port in Estonia that stopped to play an important transit function for Russian cargoes and serves mainly the domestic economy, that explains its weak overall market position. Another phenomenon is Kaliningrad, confirms the previous observation that due to its enclave position that leads to additional time and transport cost losses for less cargo is transported to/from the port.

Ro-ro market has moderate high concentration. But the countries with the largest shares in this market are different from the previous commodity markets. Estonian port of Tallin along with Lithuanian port of Klaipeda show significant growth and market shares (in 2011 mutual market share of almost 50% and average growth rate of 11% yoy). The rest shares are distributed among Russian, Polish and Latvian ports with market shares between 15%-20% each. The port characterized by the “challenge of the periphery” can be definitely considered Hamina with nearly no ro-ro traffic (market share of 0,1%) and Riga that continues to lose its market share (in 2011 dropped to 1,3%) with a yoy growth rate of almost -52%.

Based on the above survey, the relative positions of the ports in the attraction of Russian and Eastern European cargoes can be summarized as follows.

### **Polish Ports**

Gdansk is increasingly positioning itself as a container hub for the Baltic area, especially for Finland and Russia. The main advantages introduced are (i) ice free navigation, (ii) shorter sailing for the large ships (onwards transshipment on small feeders), and low cost structure (handling and port costs). Moreover they actively expand the container hinterland reach including Central and Eastern Europe. Another commodity that is strongly attracted by Polish ports is Ro-ro further heading to Russia, Finland and Central and Eastern Europe as well as for local consumption. Losing the transit crude oil from Russia, merely in favour of newly built Ust-Luga port. The managerial output for Polish ports based on the undertaken survey can be formulated as follows: (i) it is anticipated that the Polish ports' importance in the Baltic container market will maintain and even likely to grow, so Gdansk's strategy to position itself as a container hub for the Baltic area, especially for Finland and Russia is proving to be successful; (ii) second important business development direction for Gdynia is the ro-ro cargo segment (autovehicles mainly). Ro-ro cargoes have potential to increase their port volumes in connection with the moderate growth of consumption power in the East Europe.

### **Russian Baltic Ports**

- **Containers.** Russian ports are leading in the container traffic in the Baltic Range (50% market share in 2011). Saint Petersburg has seen during the last five to ten years an improved performance of its container terminals, the establishment of extended gates (improved custom procedures), and a further expansion of its capacity. All this has just recently been underlined by the entry of foreign market players into the capital of the operators, such as APMT and TIL (MSC).

- **Crude Oil.** Oil market in the Baltic Range is led by Russian ports as well with about 57 % of market share in 2011. Recently the second Baltic pipeline BTS-2 has been opened, ending in Ust-Luga port. Furthermore, the facilities in Primorsk, at the ending of BTS-1 pipeline show to be very successful and secure a continued connections to the world markets via Rotterdam. These developments increasingly rule out historic connections in Estonia and Latvia (Ventspils) and reorientate the oil traffic to domestic ports of Russia.
- **Dry Bulk.** Expansions in Ust-Luga and Vyborg for mainly coal have increased the pressure on traditional coal outlet ports in Latvia and Estonia. Nevertheless dry cargo market is more deconcentrated than previous ones (25% of market share in 2011), a considerable part of Russian export traffic is still shipped via EU ports of the Baltic Range.
- **Ro-Ro.** Recent expansions in Saint Petersburg and Ust-Luga, and improved service and quality levels are putting increasingly pressure on imports through especially Finnish ports of Hamina. Moreover, further expansions for Ro-ro are planned both in Ust-Luga and in the Saint Petersburg area (Bronka development). In 2011 Russian ports' market share in ro-ro traffic in the analysed range reached 23%.

### **Lithuanian Port/ Klaipeda**

Klaipeda has currently only 10% of its cargo being Russian cargo. Klaipeda found its way and is mainly focused on domestic demand (56%) and Belarus (31%). The rest of the transit traffic of the port (2,5%) originates mainly from Kazakhstan, Ukraine, Latvia, Uzbekistan and Estonia. Cargo flows from Ukraine were detected in the categories of food products and fodder, timber and ferrous metals and the cargo flows from Kazakhstan were basic commodities. Overall, Latvian port succeeded in attraction of such commodities as: Dry bulk, liquid bulk and general cargo. In addition, Klaipeda has high quality specialized stevedoring services, and therefore often serves as the port of choice for CIS countries (especially special and project cargoes). The managerial implication for port of Klaipeda can be to maintain the status of port with a strong transit function (for Belarus, Russia and other East European countries). However, the "Viking" railway project connecting Black Sea (via Ukrainian ports) and Klaipeda that started of in 2003 does have unutilized container transit potential, that could be further employed.

### **Latvian Ports**

The Latvian port sector is mainly dominated by the country's centre, Riga. Due to Riga's good railway connectivity, its mostly ice free navigation, and its proximity to Moscow, as well as the strong cultural ties, Riga succeeds to maintain its position as an important gateway to Russia. This mostly for coal, containers and fertilizers. As it stands for Liepaja (the smallest port of Latvia) its main commodity is grain products, which are originating from Russia, Kazakhstan, Ukraine, Belarus and Baltic states. A common suggestion for Latvia and Estonia would be a more efficient utilization of the "Zubr" railway scheme opened in 2009 that as "Viking" project connect the Black Sea and Baltic Sea regions.

### **Estonian Ports**

Estonian ports already mostly plied back to service domestic demand only. However, also some specialized cargoes demanding high-level qualitative services have been implemented such as liquid chemicals and products in Silamae and Ro-ro cargoes in Tallinn. The port of Tallinn still has a significant transit function for oil products mainly, originating from Kazakhstan, Belarus and Russia.

## Finnish Ports

Finnish ports have been confronted, especially during the last five years, with a strong competition and loss of cargo in containers and Ro-Ro due to Russia's improved capacity and performance. Currently these ports are searching for a new definition of their existence.

## LNG

A complete separate commodity is represented by the upcoming LNG terminals all over the Baltic area. These huge investments are triggered by the political choice for less dependence on Russian gas.

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## KONKURENCJA O ROSYJSKI I WSCHODNIOEUROPEJSKI RYNEK MIĘDZY PORTAMI WSCHODNIEGO WYBRZEŻA BAŁTYKU

### Streszczenie

W artykule opisano porty bałtyckie w procesie dostosowywania się do zmieniającego się otoczenia. Unia Europejska jest najważniejszym partnerem handlowym Rosji. W 2010 roku udział UE w obrotach handlu zagranicznego Rosji stanowił 50%. Udział ten będzie się nadal zwiększać z powodu niedawnego przystąpienia Rosji do Światowej Organizacji Handlu (od grudnia 2011 r.). Niniejszy artykuł ma na celu przedstawienie obecnej sytuacji gospodarczej portów wschodniego wybrzeża Morza Bałtyckiego wraz z jakościową analizą ich zapleczy. Przeanalizowano wyniki, jakie uzyskują poszczególne porty w pozyskiwaniu rosyjskich i wschodnioeuropejskich ładunków.

**Słowa Kluczowe:** konkurencja, porty, Morze Bałtyckie, rynek rosyjski, obroty ładunkowe portu, zaplecze

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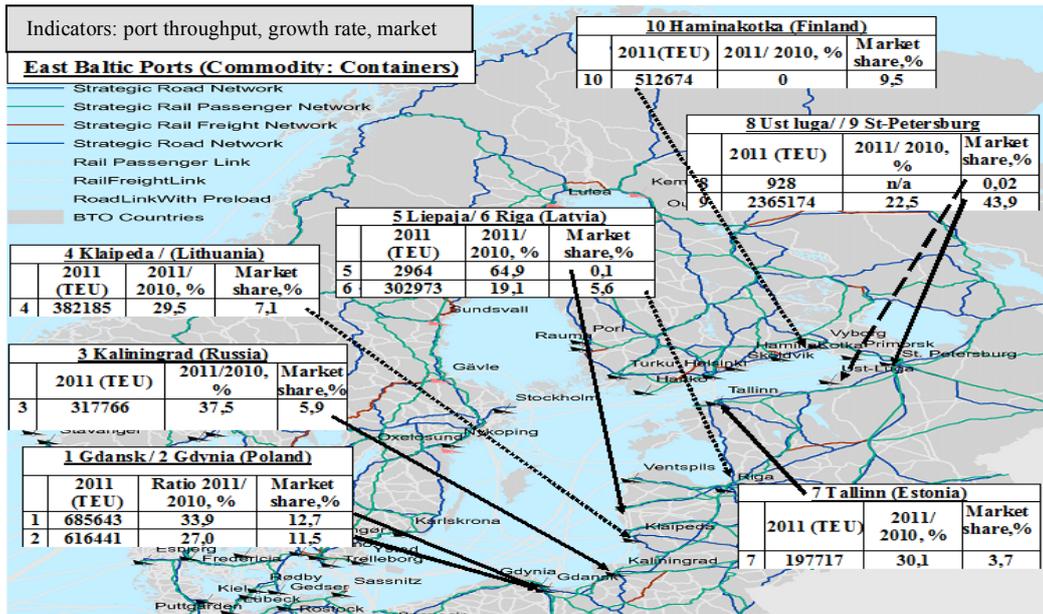
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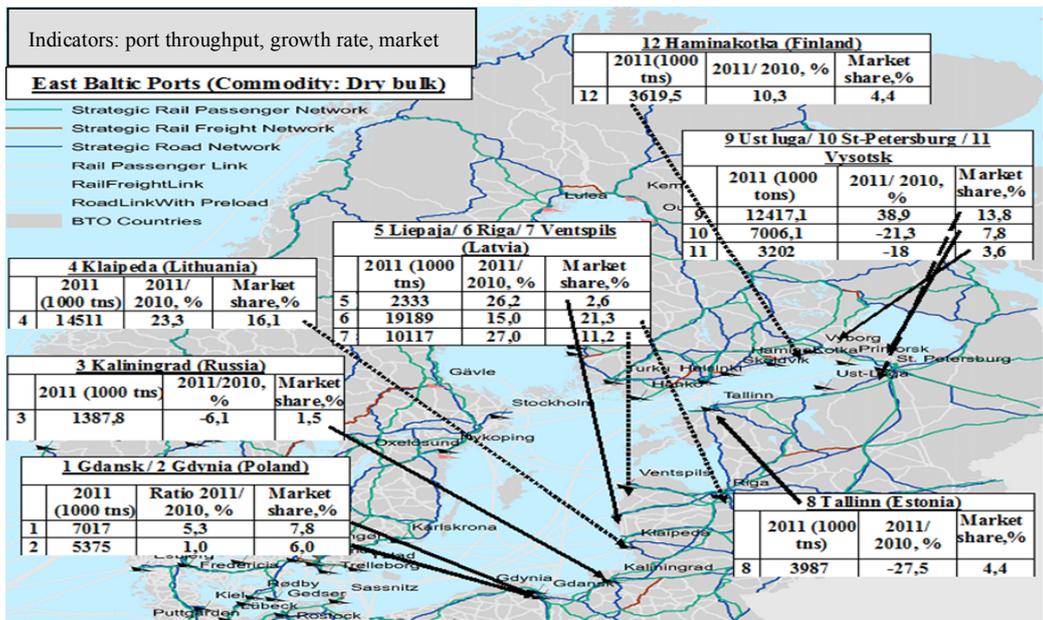
Appendices

Appendix 1. East Baltic Ports (commodity: containers)



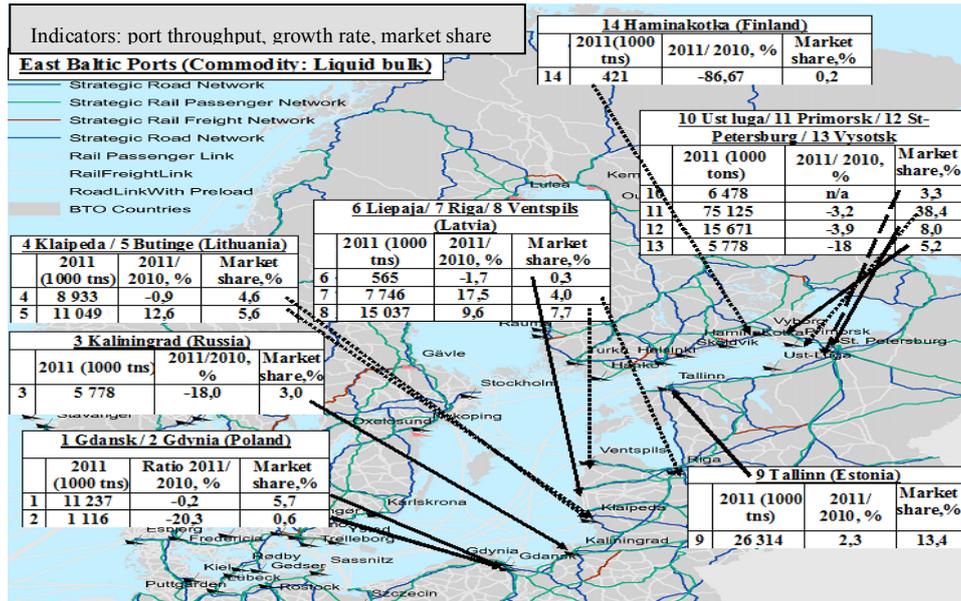
Source: ESPO

Appendix 2. East Baltic Ports (commodity: dry bulk)



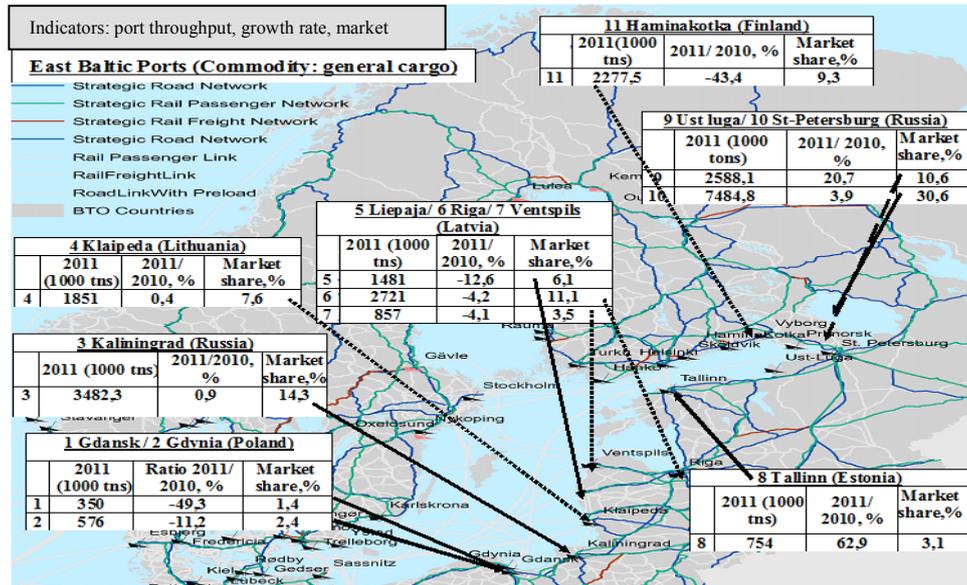
Source: ESPO

Appendix 3. East Baltic Ports (commodity: liquid bulk)



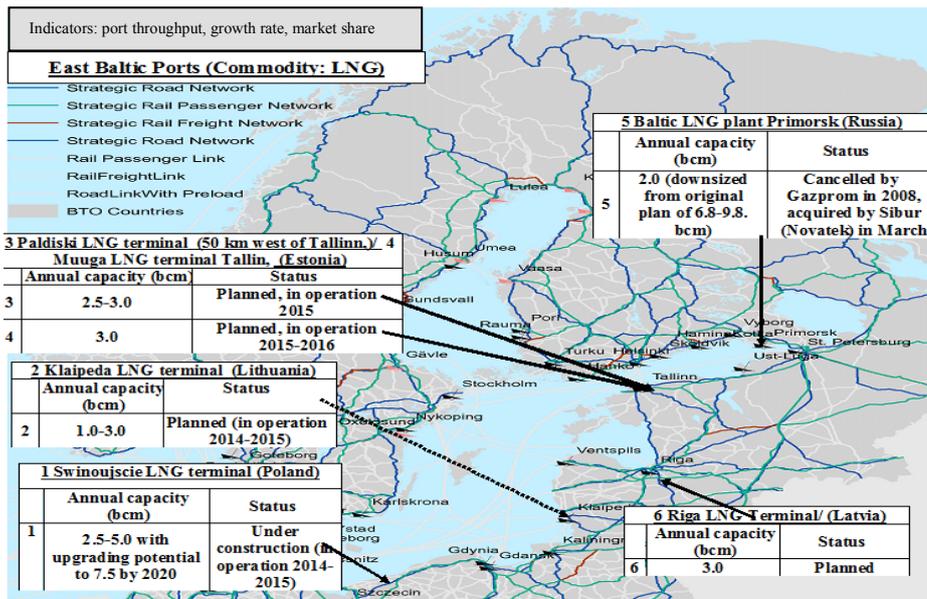
Source: ESPO

Appendix 4. East Baltic Ports (commodity: general cargo)



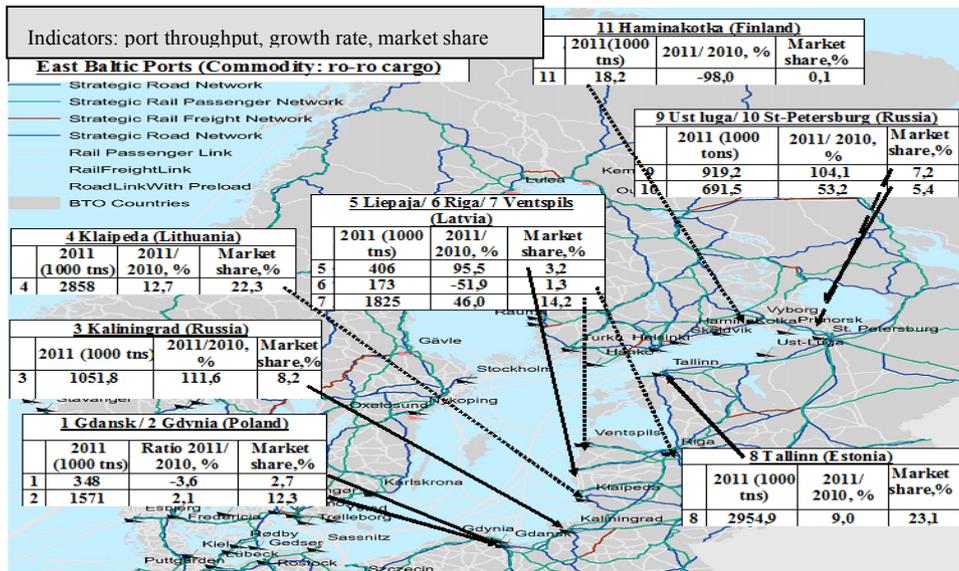
Source: ESPO

Appendix 5. East Baltic Ports (commodity: ro-ro cargo)



Source: ESPO

Appendix 6. East Baltic Ports (commodity: LNG)



Source: ESPO