REDUCING EMPTY CONTAINER FLOW BY PROMOTING BALTIC AND RUSSIAN'S WASTEPAPER EXPORT TO CHINA THROUGH PORT OF TALLINN

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In 2006 out of one hundred imported marine containers from China to Europe, forty one were repositioned to China empty and from Russia at least seventy. To promote a healthy trade between these countries, it requires a more balanced cargo flows. It is of high importance that the marine containers filled with commodities sent from China to the Baltics and Russia would not be transported back to China empty. This paper provides a global analysis on freight flows by commodity to and from China with focus on a comparative analysis of potential export cargo to China. Our goal is to explore the possibility and to propose a logistics mechanism to promote the growth of container trade between China and Russia via Estonia. In developing our analysis, wastepaper is considered in this paper as one of the potential export commodities from Russia and Baltics through Estonia to China. The potential of this commodity to fill containers that would otherwise be repositioned empty to China, and the possibility of consolidating empty containers at the Port of Tallinn from other trade flows with China, is examined.

Keywords*: Wastepaper, container, export, market, trade, port*

1. Introduction

Russia's import in containers has been growing rapidly and similar trends are observed in Estonia, Latvia and Lithuania (Baltic countries). These countries have a similar problem in trade with China, where the cargo flow imported from China clearly exceeds the flow of exported cargo. For example Estonian cargo export flow in monetary value to China was 314 million USA dollars in 2006, and import from China in the same year was 536 million USA dollars, that means import from China to Estonia was 71% higher than export. Similarly, in 2007 Russian cargo import from China in monetary value was 28.7 billion USA dollars and export to China was 19.5 billion USA dollars. China export to Russia was 47.2% higher than Russian export to China. In addition to rapid growth of trade, China, Estonia, Latvia and Lithuania have experienced fast growth in GDP in recent years.

All countries actively trading with China have been searching for solutions to deal with the issue of empty marine containers returned to China. China experiences similar problems due to its imbalanced trade with Europe and Russia. As the majority of Port of Tallinn cargo flow is made up of transit cargo (about 84.4% in 2006) [1], mostly of it was oil products. These transit cargo flows could substantially decrease in the future when the development of Russian's owns ports become available. Therefore, it is important for Port of Tallinn to promote variety of transit cargoes and create possibilities in different countries between which the transit trade in the port would take place.

The biggest difference between the countries lies in the fact that Russia exports mostly its own energy resources, like oil and coal, to China. Estonia, Latvia and Lithuania lack their own energy resources. At the same time the three Baltic countries participate in the transport of Russian energy carriers and mineral resources as transit countries and import cargo from China in containers. The biggest potential of Port of Tallinn is to become one of the gateways through which containers from China to Russia will continue their trip to Russia by road and rail. As container flow to Russia is large it is highly important to consolidate from Russia and the three Baltic countries enough commodities returned to China in marine containers. This enables to keep the number of empty containers returned to China as minimum as possible, which surely serves as one important argument in cargo flow logistics.

Based on current logistics world practice we analyze different cargo groups transported to China and provide a comparative analysis of cargo exported to China. We are looking for possibilities to increase the number of containers sent from China to Russia via Estonia. We also offer a possibility to decrease the flow of empty containers returned from Russia to China.

2. Ports of Los Angeles and Long Beach – A case study on the Containerization of wastepaper exports

In this section, we will discuss a best practice on increased wastepaper export through Ports of Los Angeles and Long Beach (POLA/LB) as a way to reduce empty container repositions to China and to promote USA containerized cargo export market.

Southern California is home of two largest container ports of the USA - Ports of Los Angeles and Long Beach (POLA/LB). Los Angeles is the largest trading gateway of the USA, leaving behind such large cities as New York and Detroit. Based on GDP in 2005 the economy of the state of California with 1.55 trillion USD ranked among the world ten largest economies, which is in the same magnitude as the economy of entire Russia (1.59 trillion USD) [2]. POLA/POLB experienced a trade value of 294 billion USD in 2006, whereas the majority of cargo flow (almost 80%) is transported in containers.

In 2006, the ports handled a total of 15.76 million TEU (twenty-foot equivalent unit), ranked fifth in the top 10 world container ports after Port of Shenzhen in China and before Port of Busan in South Korea. The trade of POLA/POLB is mostly based on cargo flow originating from Asia. The largest trading partner of POLA/POLB is China with 102 billion USD, it comprises 36% of the entire trade between China and USA [3].

POLA/POLB are important gateways of the Asia-USA trade, as over 40% of the total cargo handled at the port continues its transport to major inland markets of the USA using intermodal transport by both road and rail [3]. This suggests a possibility of Port of Tallinn become transit gateway serving marine containers transported from China end route for Russia and Europe markets. Based on 2006 statistics, the share of empty export containers for example in Ports of Los Angeles alone was 64 %. Overall, 60% of total US containers were returned to Asia empty [4]. As demonstrated in Table 1, in monetary terms, wastepaper represents a significant commodity of export cargo handled at the port of Los Angeles in 2005 with almost 40% increased as compared to 2004. Among other fast growing reusable export materials also include copper, scrap metal and aluminum. Over half of the export commodities presented in Table 1 are destined for production and reproduction plants located in China.

Table 1. Top Los Angeles exports to China 2005 [5]

RANK	COMMODITY	VALUE USD	CHANGE
	Total all commodities	11 726 022 147,0	19,20%
1	Computer chips	1 181 243 360,0	6,70%
2	Cotton, not carded or combed	925 916 900,0	-1,90%
3	Scrap iron, steel	517 770 932,0	52,70%
4	Copper waste and scrap	317 928 411,0	92,80%
5	Sheepskins, horse hides	285 729 727,0	53,30%
6	Paper, paperboard scrap	284 271 913,0	39,60%
7	Polymers of ethylene	275 000 421,0	44,60%
8	Aluminium waste and scrap	246 520 713,0	125,80%
9	Motor veichles for transporting people	241 944 408,0	215,70%
10	Berylium, chromium, germanium, vanadium, etc.	204 907 392,0	736,10%

As shown in Figure 2, in term of TEU volume, wastepaper export constitutes the largest share of 40% (or about 165 813 TEU) among the top 5 export commodities handled by the port of Los Angeles in 2005. Follows wastepaper are 21% (or 88 369 TEU) in cotton, 14% (or
57 905 TEUs) in animal feed, 13% (or about 51 731 TEUs) in synthetic resin and scrap metal ranks fifth with 12% (or 50 864 TEUs) share [4].

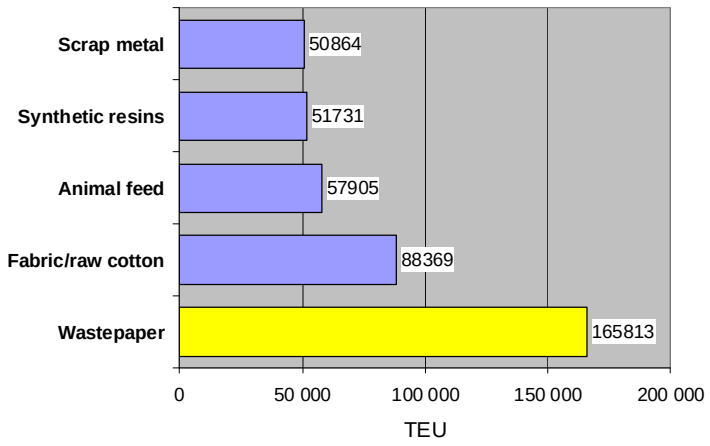

Figure 1. Top 5 Export Commodities Handled by the Port of Los Angeles in 2005 [6]

3. Wastepaper Volumes of Estonia, Latvia, Lithuania and Russia

Baltic countries and Moscow, St. Petersburg together with provinces are areas with rapidly increasing consumption. Together with increase in the economic growth of the countries also people's income will increase. By economic growth of countries Russia is not a country with most rapid growth (6,7% in 2006), but this economic growth is sufficiently big for Russia's retail trade to grow from 245 billion USD in 2006 to 526 billion USD in 2010. Thereby foodstuff retail trade will grow from 113 billion USD to 203 billion dollars during the same period. An important contribution into the commodities sold in Russian retail trade comes from China, which export to Russia in 2006 increased by 19.8% or amounted to 15.8 billion USD compared to 2005.

In Russia the population is 142 million while all together only 7.56 million people live in Baltic countries. We are going to use these figures in accounting wastepaper markets of Russia and Baltic countries.

Russian wastepaper market volume is estimated to be 9 million tons per year, of which only 3 to 4% is reused and the rest a 96% is ended up to the dump field. In Moscow and the province of Moscow wastepaper reused amounts to 20 % [7]. Moscow together with the province of Moscow produces 260 000 tons of wastepaper and cardboard per year in 2005. The province of Moscow and the city of Moscow accommodate a total of 15 million people, which makes 17.3 kg wastepaper collected per person. Calculating this amount for the city of St. Petersburg and the province of Leningrad, where the population is 6.4 million, the market volume will be 111 000 tons of wastepaper per year. Hence, the market volume of two Russian large centres is 371 000 tons per year.

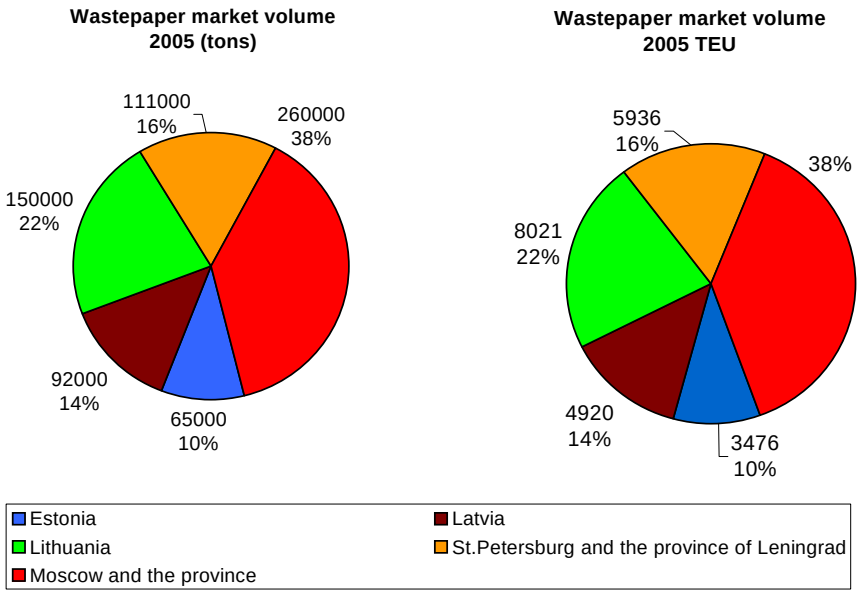

Figure 2. Wastepaper Market Share of the Baltic Countries, Moscow and Provinces of St. Petersburg and Leningrad in 2005 (tons) [7], [8], [9]

As demonstrated in Figure 2, the market volume of reusable wastepaper of the Baltic countries and the cities of St. Petersburg and Moscow, the provinces of Leningrad and Moscow totals to 678 000 tons per year. The share of the Baltic countries is divided as follows: Estonia 65 000 tons, Latvia 92 000 tons and Lithuania 150 000 tons. Considering the population of the Baltic countries the quantity of reusable wastepaper per person is the following: Estonia 49 kg, Latvia 41 kg and Lithuania 42 kg. Accommodating the corresponding amount of wastepaper into twenty foot containers on an assumption that one container accommodates 18.7 tons of wastepaper, the result will be a market volume with the size of up to 36 257 TEU per year. Taken separately by countries from Russia 19 840 containers, from Estonia 3476, from Latvia 4920 and from Lithuania 8021 containers could be returned to China by utilizing empty containers need to be repositioned to China. From the Baltic countries alone 17 417 containers could be added to container transport returned to China.

Large part of wastepaper collected from Baltic countries and the cities of Moscow and St. Petersburg together with provinces has been exported in recent years. However, wastepaper export has not been a systematic and separate export branch. The cause is not due to lack of wastepaper, but more likely due to poorly organized wastepaper collection system and the lack of wastepaper market as such together with lack alternative extensive export markets.

Based on the opinion of specialists the annual reusable wastepaper market volume in Estonia is 65 000 tons and according to the forecast the market volume will increase minimally by 10 % every year. The total market volume of reusable wastepaper in the Baltic countries is 307 000 tons per year [8].

These quantities indicate the actual potential of the market, considering the quantity of reusable wastepaper per one person in a year. Hereby comparing countries most producing reusable wastepaper as a ratio

of the quantity of reusable wastepaper and population, we will get the following results (kg of wastepaper per one inhabitant in a year): USA 183 kg, Japan 158 kg and Germany 174 kg. The corresponding data for the Baltic countries is the following: Estonia 49 kg, Latvia 41 kg and Lithuania 42 kg. In Russia the corresponding figure is 4 kg and in the other neighbour of Estonia – Finland 162 kg. In China 13 kg of reusable wastepaper per person in a year was produced.

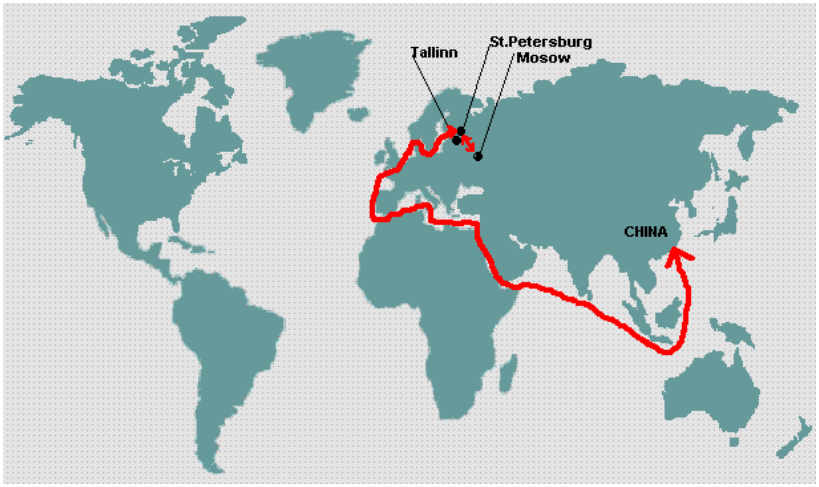

Figure 3. Container Flow Route from China to Russia and Back to China with Wastepaper Logistics

Wastepaper export in Russia is also favored by the price of transport, which for example in case of container traffic from Estonia to Moscow by auto transport already includes the price of return transport of the empty container. Rail transport of a full container to Moscow and back to Estonia has to be paid for in both directions, but is altogether four times cheaper than auto transport. Yet, in such a case there shall be wastepaper collection, sorting and container loading points in railway yards in Moscow. In case of auto transport such warehouses may have different locations, as auto transport is logistically more flexible. In addition to this auto transport to Moscow is 3.5 times faster than rail transport. Sending of a container directly to Moscow client's using auto transport takes up to two days, by rail transport up to a week. As majority of container transport is performed in different ports, like for example in Los Angeles to the extent of 72%, in St. Petersburg to the extent of 98%, in Hamburg to the extent of 67% and in Tallinn to the extent of 93% using auto transport, it is expedient to use auto transport also at the transportation of wastepaper [10]. Auto transport is also favored by the fact that wastepaper collection warehouses are not converged around railway shunting yards in Russia.

Sorting of wastepaper starts at everybody's home. Everybody of us can separate wastepaper from other refuse. It is possible to take wastepaper to a special collection point or refuse collection companies with special vehicles can collect scrap paper from people. Hence, it is important to educate the population to make people aware of the relevance of collection of wastepaper both in terms of economy and ecology. Statistically, for example in Estonia the majority, i.e. approximately 80% of the wastepaper market is contributed by the population and 20% by enterprises [8]. Here we should point out that levels of collection of wastepaper differ largely from country to country.

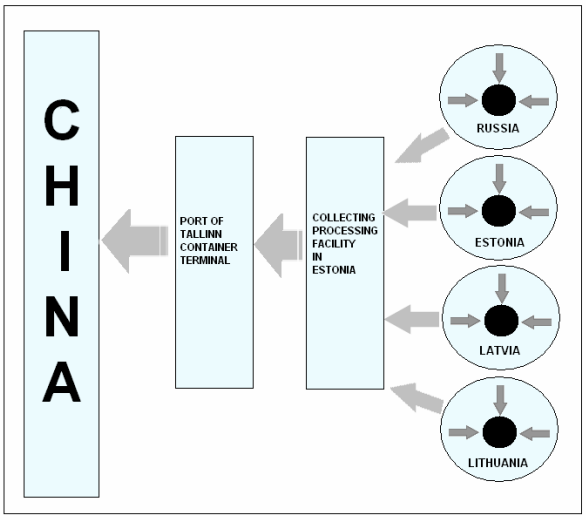

Figure 4. Chart of the system collecting wastepaper and sending through Estonia to China

In Figure 4, there is a chart of wastepaper logistics. Wastepaper is collected in Russia, Estonia, Latvia and Lithuania. Next, the collected wastepaper is transported in containers by vehicles or trains to the sorting station of wastepaper located in Estonia. The sorting station is situated at the port or in its close vicinity. In addition to sorting, wastepaper is baled and loaded into empty containers at the station. The containers filled with wastepaper are transported from the station of wastepaper to the container terminal situated at the Port of Tallinn. From the port the containers filled with wastepaper are shipped to ports in China.

We are going to analyze potential volumes of the wastepaper markets of the Baltic countries and the city and province of Moscow and the city of St. Petersburg and the province of Leningrad. We are using the example of Finland, where 162 kg of wastepaper per one person is collected a year. Now let's use the given quantity at the considering of a perspective wastepaper market based on the number of population of the given countries for 2014 and present the results in tons as well as recalculated in containers.

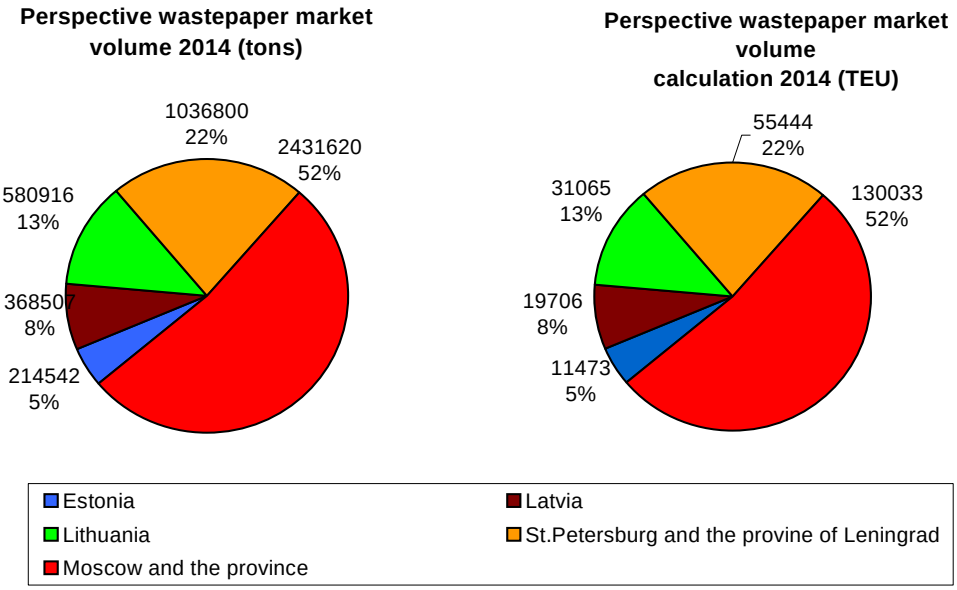

Figure 5. Perspective wastepaper market Market Share of the Baltic Countries, Moscow and provinces of St. Petersburg and Leningrad in 2005 (tons) [7], [8], [11]

Using calculations we get 4 632 385 tons as the wastepaper perspective common market volume. Let's calculate the given market volume into containers as a result of which we will get the results presented on the graph. Potential common market volume in containers is 247 721 TEU. Let's recall that in 2005 Port of Los Angeles exported 165 813 TEU of wastepaper, hence this is a market volume to be taken seriously also in the future.

Conclusions

Due to increase in container traffic volume in Russia also container traffic through three Baltic countries increases. Growth of Russian import container flow is principally based on containers transported from China. For this extensive export articles have to be found for containers returned to China. As commodities imported in containers from China to Russia are directed to areas, where retail trade and purchasing power increase most rapidly wastepaper is a suitable export article. Population and consumption in Russia is largest in Moscow and the province surrounding the city and in St. Petersburg and the province of Leningrad.

Collection of wastepaper and shipping it in marine containers to China is a system that functions worldwide. The process enables to reduce the transport of empty marine containers back to China. This, in turn, is economically expedient since the transport of empty marine containers to China does not yield any profit, yet marine containers must still be returned there.

Wastepaper export from Russia to China is also supported by a large wastepaper market in rapidly developing areas with dense population of Moscow and the province of Moscow and St. Petersburg and the province of Leningrad. Presently Russian potential wastepaper export market volume amounts to 371 000 tons or calculated into containers a total of 19 840TEU. The wastepaper export market volume of Estonia, Latvia and Lithuania is 307 000 tons or 16 417TEU. The perspective wastepaper export common market volume is 4 632 385 tons or 247 721TEU, using Finnish statistics at the collection of wastepaper per one person a year.

A uniform system of collection, processing and transportation of wastepaper must be developed for the purpose. It is important to teach the population to collect wastepaper and to separate it from other refuse. The governments should also promote a more active collection of wastepaper through respective regulations.

As Port of Tallinn has experience as a port servicing Russian export, we have a possibility to become also the tender of Russian import and export containers.

For this we should be able to organize wastepaper export from Russia and the Baltic countries through Port of Tallinn into China. At the launching of the reusable materials plant Estonia can include additional transit container flows from China into the largest port in the ownership of the state – Port of Tallinn. Reusable materials plant would service wastepaper volumes collected from Estonia, Latvia, Lithuania and major Russian cities and provinces and process wastepaper into reusable wastepaper. This in turn enables to construct terminals supporting additional container transport and creating additional value in the port and creates additional volumes also for rail transport and the entire transit chain.

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