

Saimaa University of Applied Sciences
Business Administration, Lappeenranta
Degree Programme in International Business

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**SOURCING OF CONIFEROUS PULPWOOD IN COMPARISON OF
SELECTED COUNTRIES**

Bachelor's Thesis 2010

ABSTRACT

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Sourcing of Coniferous Pulpwood in Comparison of Selected Countries,
70 pages, 2 appendices

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Unit of Business Administration, Degree Programme in International Business
Bachelor's Thesis 2010

Instructor: Research Manager Kirsi Viskari

The aim of this thesis is to analyse factors affecting wood supply from the selected countries – Sweden, Russia and Latvia. The factors have been identified during an internship at a wood sourcing company in Germany. The analysis is based on publications of international and national forestry organisations and forestry statistics, as well as experiences of the training company in this field. Therefore a descriptive approach is used.

The analysis encompasses a theory study and an empirical study. The theory analysis provides the reader with information on country specific forest resources, domestic industry, market conditions, logistics and infrastructure, as well as forest certification. Subsequent to the theory study, an interview is used as a qualitative research method in order to examine in what way the mentioned factors affect wood sourcing based on company's experience in wood sourcing from selected countries. The outcomes of the interview are applied to the theory analysis.

The results of the analysis are carried out in recommendations based on the author's given level of market knowledge. The analysis identifies Russia not being profitable for wood sourcing from the point of view of a German company. Additional problems are identified to be insufficient certification, lack of infrastructure and logistics facilities, as well as high level of corruption and flawed documentation. Sweden proves to provide a flexible sourcing environment in respect to certification, logistics and infrastructure, and to be profitable in regard to purchasing costs based on statistical data. However, based on its strong forest industries Swedish wood supply to foreign markets is concluded to be limited in the future. Latvia proves to provide the optimal sourcing environment as can be concluded based on this analysis. The country's rather weak forest industries allow sourcing of coniferous pulpwood. Additionally, the analysis shows Latvia fulfilling requirements regarding forest certification, logistical facilities and infrastructure, and the cost aspect being acceptable.

Key words: forestry, forest industries, coniferous pulpwood, sourcing affective factors, Sweden, Russia, Latvia

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Appendix 1 UNECE/FAO Joint Forest Questionnaire Definitions (13 pages)

Appendix 2 UNECE Breakthrough of forest product groups (2 pages)

ABBREVIATIONS AND ACRONYMS

CoC	Chain of Custody
CW	Controlled Wood
FAO	Food and Agriculture Organisation
FSC	Forest Stewardship Council
ha	hectare
ITTO	International Tropical Timber Organisation
LVL	Latvian Lats
LVM	Latvijas Valsts Mezi (Latvian State Forest)
m.t.	metric ton
PEFC	Programme for Endorsement of Forest Certification Schemes
RUB	Russian Rouble
SEK	Swedish Krona
u.b.	under bark
UNECE	United Nations Economic Commission for Europe

1 INTRODUCTION

Sourcing is a new term for buying in modern enterprises, but it is more complex than just paying the price for a good or service. It is a whole process of finding, evaluating, and selecting suppliers that can offer the best solution for a given company. The main goal of a sourcing strategy is to provide the company with all necessary goods and services in required quality and quantity at the most efficient cost. Developing a sourcing strategy requires knowledge about markets a company already operates in and is planning to enter, as well as recognition of future trends to be able to adjust to changing market conditions.

During an internship at a wood sourcing company the author got involved in the process of sourcing and decided to conduct a comparative market analysis for three major players regarding wood supply in the Baltic sea region - Sweden, Russia and Latvia. The choice of countries was made based on company's operation and interest in expanding sourcing activities in these countries. Sweden and Latvia have been trading partners for several years, whereas Russia has become one just recently. All the three countries have vast forest resources, and based on Sweden's and Latvia's relatively close geographical location, and low wood prices in Russia which would compensate high logistics costs, wood sourcing from these suppliers seems to be reasonable. But logistic costs and raw material price are not the only factors to take into account while wood sourcing. The following analysis encompasses additional sourcing affective factors identified during the internship.

The thesis aims at analysing factors that affect sourcing of wood. For this purpose the selected countries are analysed regarding factors such as country's forest resources, domestic industry and market conditions, geographical location and infrastructure as well as wood certification. Subsequent to the analysis of countries regarding the mentioned factors, an interview is done with the head of roundwood sourcing department at the training company in order to analyse in what way respective factors affect company's sourcing decision in every-day business. The interview's outcomes are applied to the country specific condi-

tions. The results of this analysis are carried out in recommendation for future sourcing operation in these countries at the author's given level of market knowledge.

During the analysis a descriptive approach is used in order to examine advantages and disadvantages of chosen countries for wood sourcing from the point of view of a German company. The focus is laid on analysing countries and their market conditions with regard to wood industries not on any particular suppliers. The sourcing process itself is not part of this thesis.

The theory part – chapters 3 to 7 – provides information on wood sourcing impacting factors that were mentioned previously. Each of the chapters examines separately the respective factors for each of the analysing countries. The overview of country's forest resources provides a general basis for the analysis in respect to the country's potential of being a sourcing partner for coniferous pulpwood. The following analysis of domestic forest industries, market conditions, and export evolution reveal information on wood availability for export and its possible costs. The following chapter gives an overview of domestic infrastructure and logistical facilities in order to examine country's flexibility in wood supply. The last chapter examines the extent of certified forest area and number of certified intermediaries as certification is an important aspect at the given company as a committed supplier of certified wood only. The empirical study contains an interview done at the training company, the outcomes of which are combined with results of the theoretical study and carried out in the final chapter.

2 METHODOLOGY

Theory study

The analysis is based on scientific publications of several official forestry organisations, professional journals, and forestry statistics.

The statistical data used in this thesis is based on the FAO/UNECE/Eurostat/ITTO Joint Forest Sector Questionnaire collected from official national correspondents (Sweden: Swedish Forest Agency www.skogsstyrelsen.se, Russia: Institute on Economics and Information for Forest, Pulp and Paper, and Woodworking Industries OAO NIPIELesprom www.nipielesprom.ru, Latvia: Ministry of Agriculture www.zm.gov.lv). According to the Forest and Agriculture Organisation (FAO), the data quality differs between countries, product and year. In fact, the author has experienced difficulties in collecting data for the analysing period as not all data is available or not documented at all. For the reader's information the official definition of roundwood is: "roundwood felled or otherwise harvested and removed... with or without bark ... in its round form, or split, roughly squared or in other form." (UNECE) It is divided in the following subgroups:

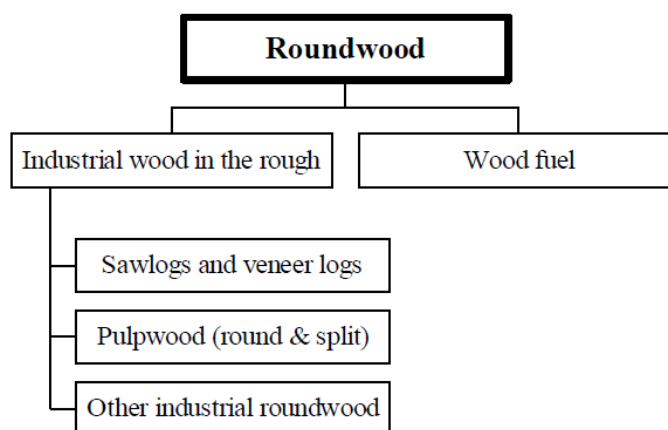


Figure 1 Roundwood subgroups (FAO/UNECE 2010)

The collected data from official forestry statistics seldom include pulpwood itself, but is recorded for the main group 'wood in the rough' or divided in subgroups 'sawlogs' and 'other than sawlogs'. So, data illustrated in the following may not represent the pure content of pulpwood, but contain other subgroups of roundwood. However, the illustrated data conforms to international definitions by the United Nations Economic Commission for Europe (UNECE) which can be seen from appendices 1 - Joint Forest Questionnaire Definitions, and 2 – Components of Wood Product Groups – if not stated differently.

UNECE emphasises that the Intra-EU trade flows are less reliable than Extra-EU as there are no data records based on customs clearance but on statements of forestry enterprises, which can trigger under-/overstatements of data due to assignment to wrong nomenclature. Additional major problem stated by the UNECE is differences in national definitions, measurement standards and conversion factors, and unrecorded removals/production (UNECE 2010).

Considering these problems, the statistical data illustrated in this thesis is not meant to cite the actual numerical data, but the development of flows in recent years.

Empirical study

As for the empirical study, the author chose to bring in practical experiences of a wood sourcing company she did an internship at. As a research method the face-to-face interview seemed to be best suitable for this purpose as it allows open-ended questions that can be better explained in case of misunderstandings, and offer a more detailed response opportunity. (Hague and Hague, 2004) The results of the empirical study shall not be seen representative for the entire wood processing industry, but understood as an example.

Analysing period

Due to continuous changes in the industry, the analysing period has been set to January 2005-June 2010 laying the main focus on recent developments.

3 FOREST RESOURCES

Forests differ from one world region to another, so this chapter is meant to provide the reader with information about forest resources of analysing countries in order to give an overview about country's extent of wooded area, forest's structure, and forest ownership allowing an assessment of country's potential of being a trade partner in terms of coniferous pulpwood.

3.1 Sweden

Among the European countries, Sweden has the second biggest forest area right after Russia. Forest is the country's most important natural resource covering



Figure 2 Sweden's forest area (FAO)

approximately two-thirds of total land area (Figure 2). According to the FAO Forest Resources Assessment 2010, the total area of forest and other wooded land accounts for 31.25 million hectares, of which approximately 23 million hectares (70%) are available for wood supply.

More than 80 percent of the forest is coniferous, whereby pine and spruce are the most common species representing 40 percent and 38 percent of all species, respectively.

(Figure 3).

The majority of pine resources is concentrated in the northern part of the country, whereas spruce is predominant in the south, among some deciduous tree species (Figure 4).

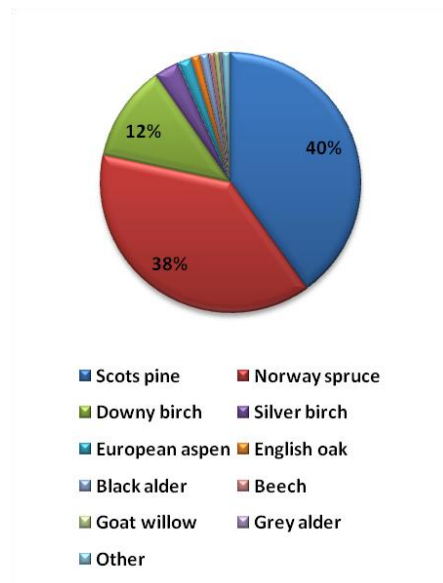


Figure 3 Sweden's forest structure in million m³ (FAO)

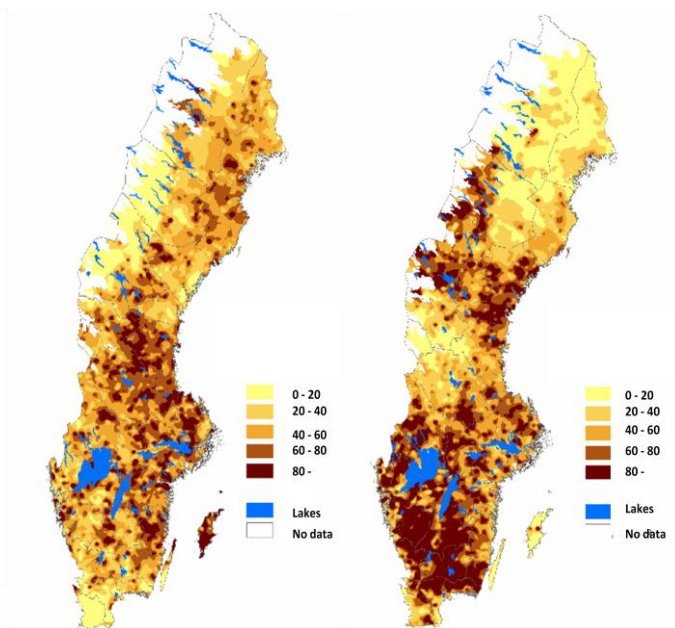


Figure 4 Growing stock of pine (left) and spruce (right) in m³/ha by geographical distribution (Swedish National Forest Inventory)

Speaking of the whole country, 48 percent of the Swedish forests are owned by individuals, 24 percent are in public ownership, and the rest is divided between private business entities and institutions (22%) and local communities (6%) (FAO 2010). But the ownership varies between country regions. In the southern part forests are mainly owned by individuals (78%), in the central Sweden private and public ownership are equally divided, whereas the Northern forests are mainly in state ownership (59%) (Skogsstyrelsen).

Privately owned forests are safeguarded by four regional forest ownership organisations – Norra Skog, Norrskog, Mellanskog and Södra – that take care of operational forestry. These associations manage about 50 percent of private forests (Nordic Family Forestry).

Today's forests in Sweden are results of sustainable forest management. During the last century they recovered from deforestation caused by land clearing, grazing, and logging for building and mining industries. The annual growth of the forest is stated to be 100 million cubic metres, the volume of possible annual cut is set to 90 million m³, the actual annual cut has been around 70 million

m³ for many years which followed by continuous increase of total growing stock (Figure 5) (FAO; Skogsstyrelsen).

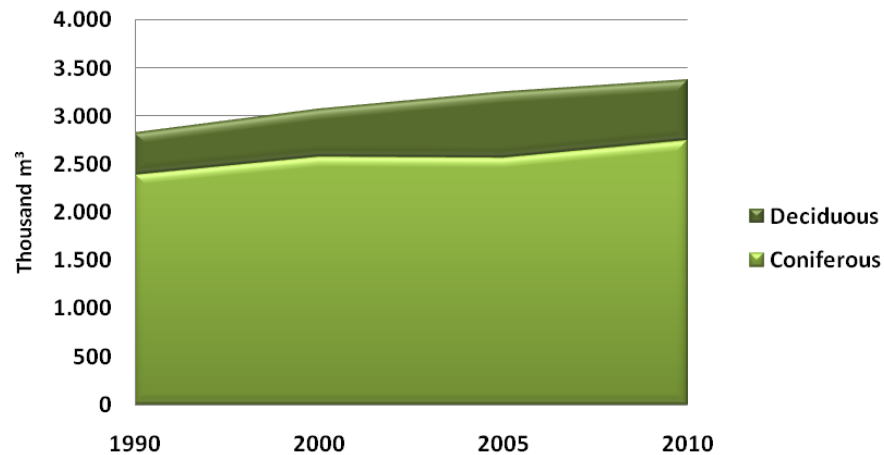


Figure 5 Total growing stock of Sweden (FAO)

3.2 Russia

Russia has not only the biggest afforested area among in this thesis analysed countries, but also in the whole world. Its forest resources are counted for more than 809 million hectares, and areas classified as other wooded land cover additional 73 million hectares (FAO 2010). Forests and other wooded land cover about the half of the country's total land area (Figure 6). Around two-thirds of forests are available for wood supply, most of the remainder being not economically accessible (Ibid).

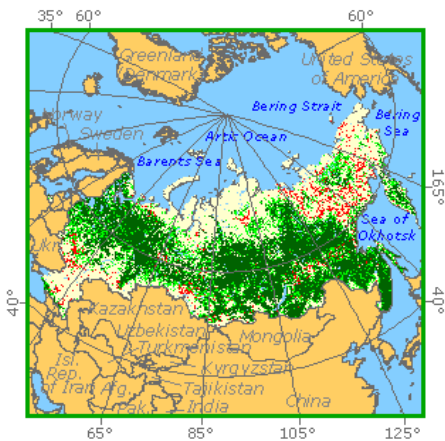


Figure 6 Russia's forest area (FAO)

Approximately 80 percent of the afforested area is populated by coniferous species, predominantly by larch (31%). Pine and spruce are the next common coniferous species representing 20 percent and 14 percent, respectively. Approximately 30 percent of coniferous forest is located in the Northern part of European Russia. In for Europe more relevant North-Western federal district forest resources are geographically divided into two parts. In the Kaliningrad, Leningrad, Pskov, Novgorod, Vologda regions, and a part of Arkhangelsk region birch and aspen forests dominate, whereas the

Murmansk, Nenetsk, the North-Eastern part of the Arkhangelsk regions, and the republics of Karelia and Komi are habitats of fir, spruce and pine forests (Figure 7).

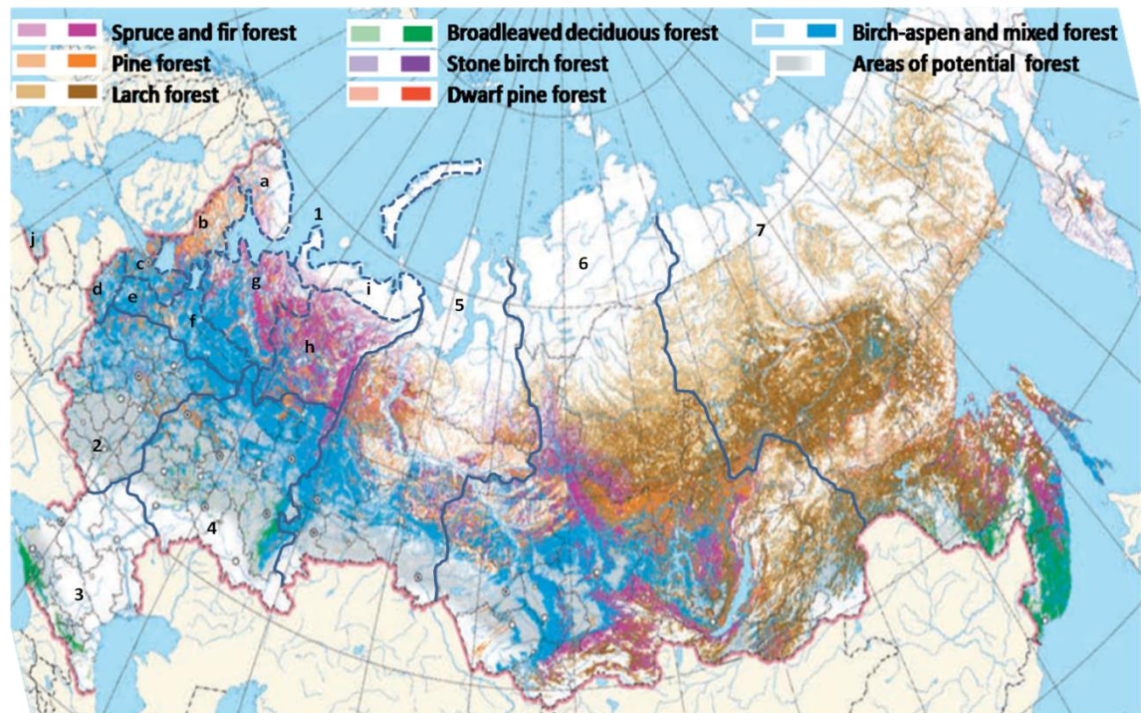


Figure 7 Structure of Russian forest and its geographical distribution by forest type (Russian Forestry Review 2007)

- | | |
|--------------------------------------|-----------------------------|
| 1 North-Western federal district | 2 Central federal district |
| 3 North Caucasian federal district | 4 Volga federal district |
| 5 Urals federal district | 6 Siberian federal district |
| 7 Far Eastern federal district | |
| a Murmansk region | b Republic of Karelia |
| c Leningrad region and St.Petersburg | d Pskov region |
| e Novgorod region | f Vologda region |
| g Arkhangelsk region | h Republic of Komi |
| i Nenetsk autonomous region | j Kaliningrad region |

Generally speaking, all forests in Russia are owned by the state and managed by several federal authorities. However, after the maintenance of the new Forest Code in 2007, the main content of which is explained in chapter 4, forest privatisation is possible. Although this is only possible for forests on the land categorised as 'land of towns' or 'agricultural land', the extent of which is very small. Harvesting rights for the so called 'forest fund' are either distributed by auctions or leased to companies and organisations that fulfil set criteria for in-

vestment projects, meaning if a company is interested in investing in Russian forest and wood processing industry it can apply for harvesting rights. Thereby the amount wished to be invested is said to be determining for contract conditions (Ryvkin 2007).

In the last decades Russian forests have been exposed to deforestation. Lack of suitable infrastructure led to expansion of harvesting areas along railroads and major rivers in northern part of the country allowing quick harvests and exports to Europe. Proper forest management was often neglected and in the course of time major coniferous forests were replaced with birch and aspen forests (Dmitriev 2006), which corresponds to the decline of coniferous species within the growing stock assessment by FAO shown in the picture below.

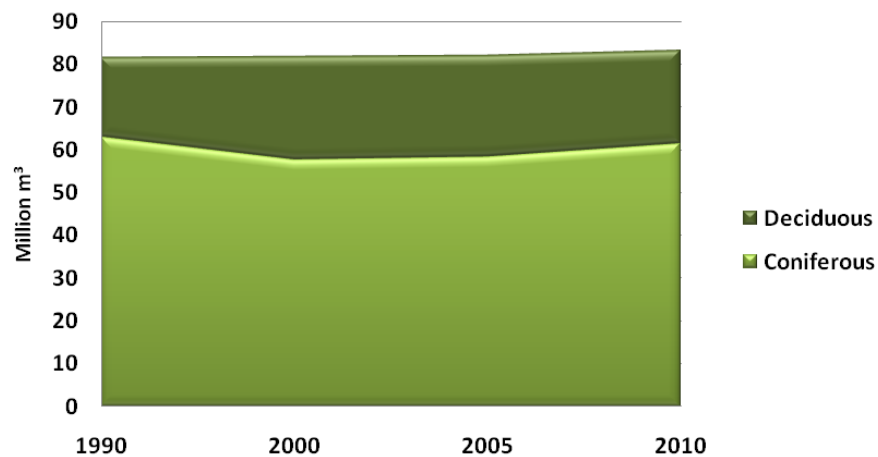


Figure 8 Total growing stock of Russia (FAO)

Lack of infrastructure is also a reason of uneven distribution of today's available resources. Studies have shown less than 60 percent of total forests being economically accessible for harvesting activities (Dmitriev 2006). As can be seen from the figure below the available resources and their usage is highest in North-Western and Central federal districts, considering the total land area, which are more developed in terms of infrastructure.



Figure 9 Percentage of forested area by region in % in comparison to economically available area and the actual harvesting volume in million m³ (Chuko 2007; Federal Forestry Agency of Russian Federation 2006)

3.3 Latvia

According to the FAO Forest Resources Assessment, Latvia's afforested area accounts for 3.4 million hectares and corresponds to 52 percent total land area coverage. The density of forested area varies throughout the country from 30 percent in Preiļi and Rezekne districts (a) and Dobele and Jelgava districts (b) to more than 60 percent in Ventspils district (c) as can be seen from the figure ten (LVM).

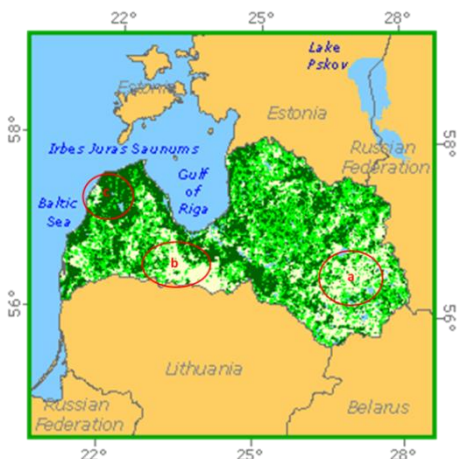


Figure 10 Latvia's forest area (FAO)

More than 90 percent of total stands are assessed to be available for wood supply, nearly the half of which being coniferous species. On the list of most common tree species scots pine comes first representing 43 percent, and Norway spruce that makes 15 percent being the third after silver birch with 28 percent among all species.

Latvia's forest ownership differentiate between tree types – public ownership, ownership by individuals, and private business entities and institutions making 54 percent, 41 percent, and 5 percent, respectively. Publicly owned forests are managed by the state organisation Latvijas Valsts Mezi (LVM), which frequently distributes cutting rights using auctions and tenders.

LVM's forest management aims at sustainability, so annual cuts are set not to exceed annual increment (LVM). Additionally, in recent years reforestation has been practiced extensively. The increment of growing stock shown in the figure 11 is due to decline of agriculture, and settlement of areas not being under agricultural or other economical usage (Zudrags 2009). Zudrags states the total increment of growing stock to be 350 thousand hectares, though not specifying the time period in question. According to FAO, Latvia's forest resources increased by 182 thousand hectares in the period 1990-2010, most of the increment being deciduous tree species.

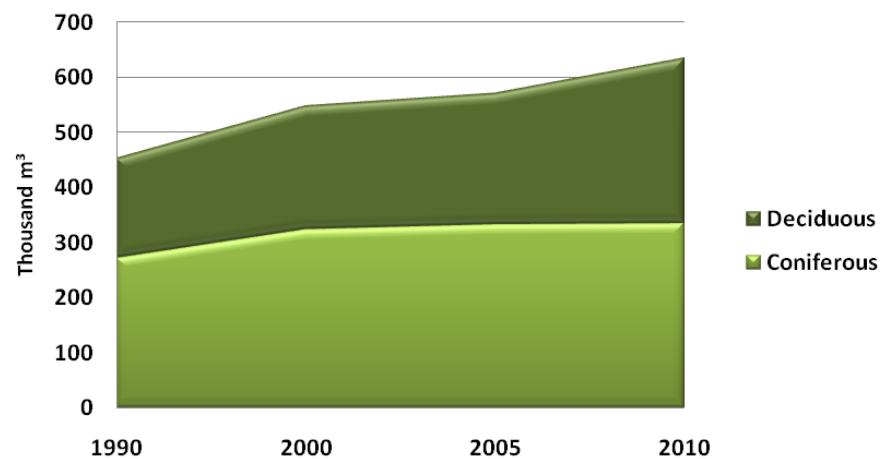


Figure 11 Latvia's Total growing stock (FAO)

4 DOMESTIC FOREST INDUSTRY AND FOREIGN TRADE

Domestic industries are fundamental for the analysis of a country's potential of being a trade partner in wood sourcing. The status of domestic industry reveals information about roundwood production, country's material consumption and the amount of materials available for export.

4.1 Sweden

4.1.1 Industry

Forest industry is one of the sectors that have greatest importance for Swedish economy. Though the forest industry's share of total exports declined from 20 to 11 percent since 1980s due to development of other industries, the importance of forest industries is still considerable (Skogsstyrelsen).

As can be concluded, Swedish forest industry is well developed. The Swedish Forest Industries Federation lists more than 1900 sawmills of every size class and 52 pulp and paper mills in 2009 (Skogsindustrierna). According to the same source, in 2008 investments in forest industries corresponded to 15-20 percent of total industrial investments, the major part of which is done in the pulp and paper sector. Investment in new technology aims at improvement of product quality, raising productivity and efficiency in energy use.

In virtue of this advanced industry development, Sweden has a greater demand for roundwood than the country can supply, which results in imports exceeding exports. In the last five year Sweden has had a negative roundwood balance with consumption exceeding domestic roundwood production by 5-6 percent in average as shown in the figure 12.

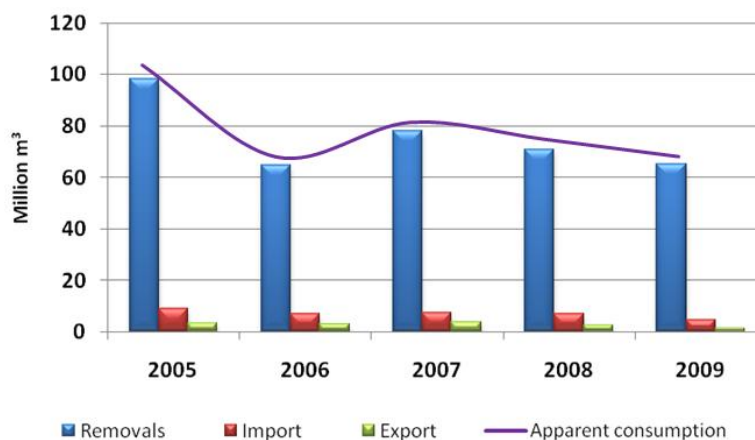


Figure 12 Illustration of roundwood balance in Sweden (compiled by the author based on UNECE Forest Products Statistics as of July 2010)

For reader's information, the exact definitions of removals, export, and import are explained in appendix 1. As for apparent consumption, it represents the subtraction of net-trade (export minus import) from total removals.

4.1.2 Foreign trade

Based on its well developed industry, Sweden's forest products export contribute a great amount to total exports. In 2009 the export of forest products amounted to SEK 128 billion. Sweden is the third largest exporter for sawnwood products and fourth largest for pulp and paper worldwide (Skogsindustrierna 2008). These products show the highest value added among forest products.

In the last few years the amount of total export of forest products remained relatively constant, despite some marginal variations, main markets being Sweden's neighbour countries Norway, Denmark and Finland, as well as Germany. The share of paper and paperboard and sawnwood products averages at 36 percent and 42 percent, respectively, whereas pulp and roundwood represent a small part since the majority of these products is processed by domestic industries (Figure 13).

For reader's information, the illustrated data in figure 13 refers to main groups of forest products. The breakthrough of these groups is shown in appendix 2.

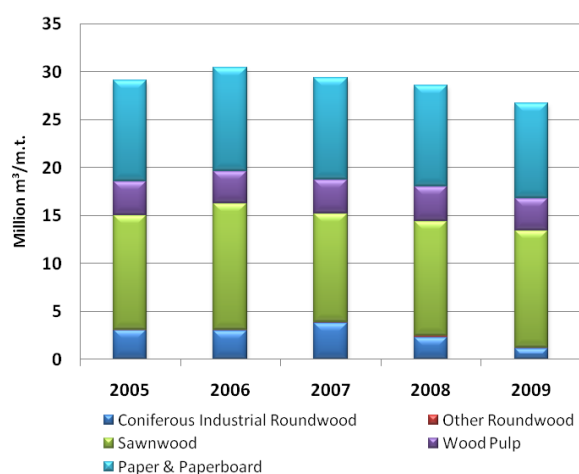


Figure 13 Sweden's forest products export evolution, roundwood and sawnwood in m³, pulp and paper & paperboard in m.t. (compiled by the author based on UNECE Forest Products Statistics as of July 2010)

4.2 Russia

4.2.1 Industry

Considering the abundance of forest resources and the country's importance as a raw material supplier, Russia's share of global production and trade in more processed products is rather small – about 1.2 percent. The reason is the overall underdeveloped forest industry. Nearly in every sector there are severe problems.

The timber industry is severely affected by lack of sufficient infrastructure. Harvesting is realised up to 90-95% through small companies that cannot afford maintenance of existent forest roads, construction of new ones – even less. Consequently, the average utilisation of Russia's great resources is about 30 percent which is way too low in comparison to European countries (Grevzov 2007). Even if the area is economically accessible the annual allowable cut is never fully exploited, as has been already shown in the figure 9. Table 1 presents some figures concerning timber resources compared to grade of utilisation of allowable harvesting volume. As expected, the European part of the country – Central and North-Western districts – shows the highest utilisation which can be explained by more developed infrastructure and industry in comparison to the whole country.

Table 1 Utilisation of harvesting amount by region, as of 2007 (Russian Forestry Review 2008, p.3)

Federal District	Timber resources, billion m ³	Amount of forest land , %			Acceptable harvesting amount, million m ³	Utilisation, %
		Total	of which:			
			softwood	hardwood		
Centre	4	35	46	54	40.4	47
North-West	10	52	74	26	117.5	44
South	0.8	7	12	88	3.5	35
Volga	6	37	36	54	69.9	41
Ural	8	38	70	30	81.9	20
Siberia	33	53	82	18	227.4	22
Far East	21	46	82	18	94.4	20

The wood processing industry is in similar shape. Production facilities run at almost full capacity so that there are less possibilities to expand unless major investments are made; equipment does not correspond to European technological stand, and duration of use exceeds its standard service by 60-80 percent tremendously affecting productivity; there has been no domestic investment to change that situation in decades, whereas foreign investors are reluctant to do so due to uncertainty in Russian forest legislation, among other deterrent factors (Dmitriev 2006).

The domestic industry is not able to absorb roundwood supply provided in Russia, and due to demand from abroad a great share of roundwood production was exported the main markets being Europe and Asia. Since the launch of increased export duties this demand fell off considerably, and so did roundwood production. These developments are illustrated in the figure below.

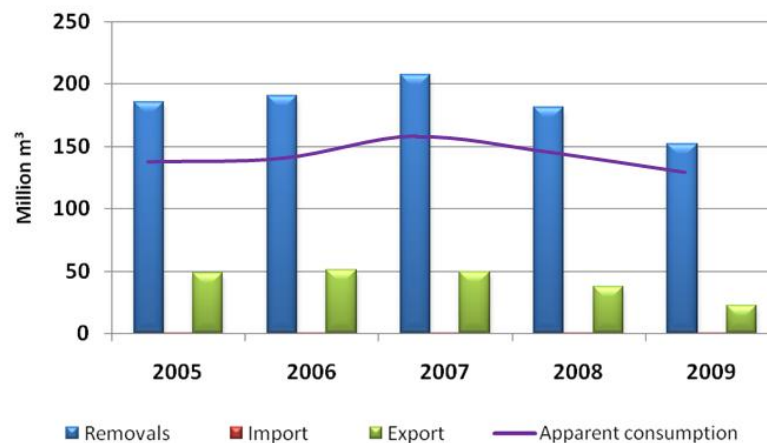


Figure 14 Illustration of roundwood balance in Russia (compiled by the author based on UNECE Forest Products Statistics as of July 2010)

4.2.2 Forest industry related policies

Since the collapse of the Soviet Union Russian forestry experienced a major decline. The consequences were export of unprocessed wood and low contribution to economy due to low added value. Russian forestry sector has been exposed to reforms for several times since then, but the recent one has been of an extent it never had experienced before.

The two main elements of the latest reform are the new Forestry Code and increased export tax on unprocessed roundwood.

Forestry Code

The new Russian Forestry Code was enacted in January 2007. The aim of the code was to improve the mechanism of governmental regulation in forest related industries through changing principles of forest management and funding, as well as management assessment systems (Yaroshenko 2007). These changes are carried out by delegating the main forest management responsibility to regional administrations (ca. 93 % of forests); reduction of the lease period for logging activities from 99 to 49 years; introduction of public auctions for timber sales in order to reduce corruption; and promotion of investment projects and infrastructure development (UNECE/FAO 2008, p. 31; Yaroshenko 2007).

Overall, the new Forest Code encompasses about 70 new regulations on federal, regional, and ministerial level. The enactment was to be fulfilled as of July 1, 2007, which it was, but in a very precipitant way. Consequently, the majority of regulations was not fully developed and are still subjects to re-development. Many regulations are perceived as controversial and Russian Federation has been experiencing problems implementing these. The main reason is said to be a lack of understanding the legislation and difficulties in coordination between federal and regional authorities (UNECE/FAO 2008, pp. 49-50).

Export tax

Russia has been acting as raw material supplier for many years, only few foreign companies settled their business within the country or invested in forest industries. In order to change this dissatisfactory situation the former President of Russian Federation Vladimir Putin approved a resolution on stepwise increase of export duties on unprocessed roundwood. Starting from July 2007 the taxes were raised from 6.5% to 20% (not less than 10€/m³), in April 2008 to 25% (not less than 15€/m³), and the final step was scheduled for January 2009 with an increase to a prohibitive level of 80% (not less than 50€/m³) (UN-

ECE/FAO 2007, pp. 25-26). The main purpose of the increased duties was to decrease export of unprocessed roundwood, and promote development of domestic in-depth wood processing as well as to attract foreign investments. The first goal was achieved very quickly, the latter, on the contrary, failed to appear. This is said to be the main reason for postponement of the last phase in tax increases for 9 to 12 months. But the final tax increase has not been enacted so far, experts even doubt if it will be ever implemented because of several reasons: Russia needs the income from roundwood exports; many Russian logging companies have had to shut down, resulting in increased unemployment; there is not enough domestic capacity to process the amount of timber previously being exported; and increased export taxes only created uncertainty among foreign investors hindering investments in manufacturing facilities (UNECE/FAO 2009, p. 49).

4.2.3 Foreign trade

Forest products contribute a major portion to total export in Russia. They accounted for 3.5 percent of the value of all merchandised exports in 2007. Speaking of roundwood, Russia's supply accounted for around 40 percent in Europe in the past years, which averages to approximately a fourth of country's roundwood production.

As can be seen from the export evolution illustrated in the figure 15, the amount of export of respective product groups declines with rising level of value added. Indeed, roundwood which has the least value added represents the greatest proportion in Russian export. With implementation of export tax the demand for Russian roundwood fell considerably – roundwood exports (coniferous and deciduous) in 2009 showed a nearly 60 percent decline in comparison to 2006 prior to introduction of export tax, and total export of forest products fell off by 40 percent in the same period.

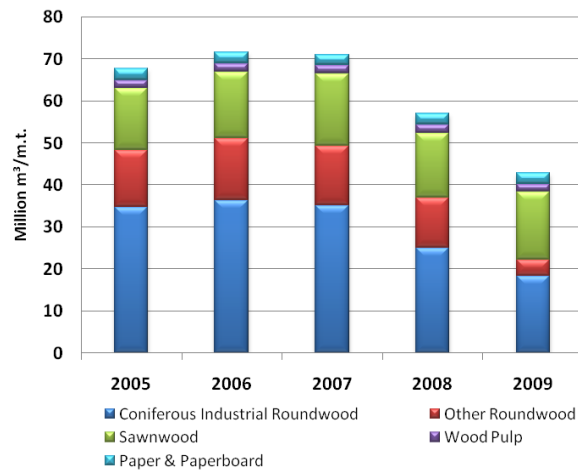


Figure 15 Russia's forest products export evolution, roundwood and sawnwood in m³, pulp and paper & paperboard in m.t. (compiled by the author based on UNECE Forest Products Statistics as of July 2010)

4.3 Latvia

4.3.2 Industry

Previous chapters described well developed domestic forest industries of Sweden and the exact opposite shape of Russia's industries. Latvia's industry is somewhere in between.

Forest industry in Latvia is perceived to be one of the most profitable sectors in domestic economy. Its contribution to GDP amounted to 5 percent in 2007, whereby the share of forest sector of total manufacturing industries accounted to 24 percent in the same year (Latvian Export Import Directory; Zudrags 2009). Advantageous factors such as vast forest resources, geographical location, and cost-effective labour force contribute to profitability of forest sector.

Alike with other industries in Latvia, forest sector growth is mostly dependent on the expansion of export opportunities as the major part of products is exported. About 65 percent of total roundwood removals have been used for domestic production throughout the period of 2005 to 2009 (Figure 16).

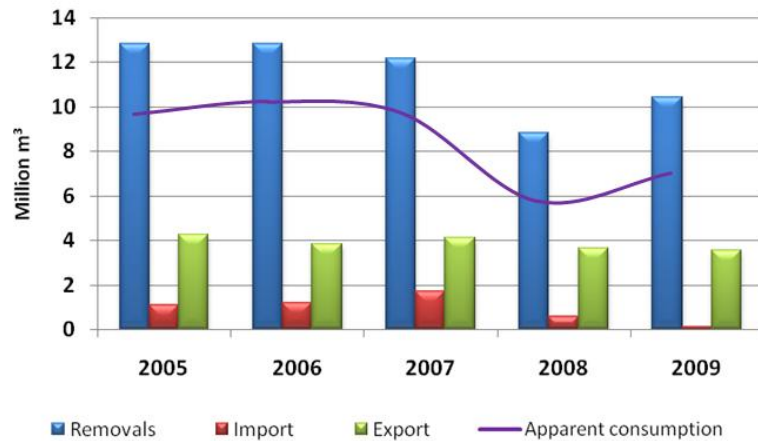


Figure 16 Illustration of roundwood balance in Latvia (compiled by the author based on UNECE Forest Products Statistics as of July 2010)

4.3.3 Foreign trade

About two-thirds of Latvian total forest products are exported mainly to European countries. The main export product in Latvia is roundwood, whereby deciduous species represent the major proportion. The overall trend is decreasing export, which is due to declining share of sawnwood. Since 2005 sawnwood exports fell from 2835 thousand cubic metres to 1631 thousand cubic metres in 2009, which makes a fall of 44 percent (Figure 17).

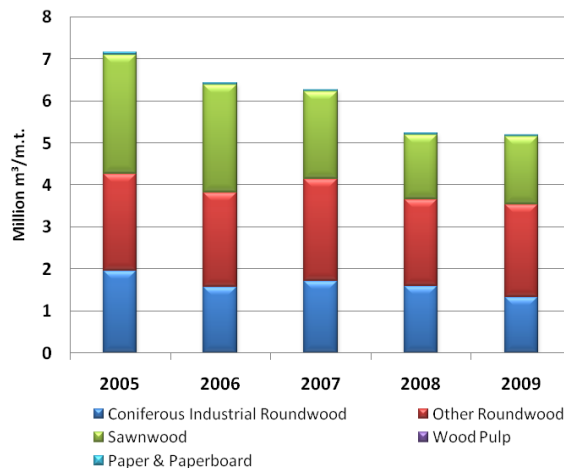


Figure 17 Latvia's forest products export evolution, roundwood and sawnwood in m³, pulp and paper & paperboard in m.t. (compiled by the author based on UNECE Forest Products Statistics as of July 2010)

5 MARKET AND PRICE DEVELOPMENTS

Cost of wood accounts for about 55 percent of total cost in pulp manufacturing (UNECE/FAO 2010, p. 51). Thus, it is the most important cost component that often decides about a pulp mill's competitive advantage. In case of a wood sourcing company it is the margin that depends on wood price, meaning company's profitability.

This chapter's purpose is to analyse what factors determine wood price, and what it is dependent upon, as well as pulpwood price developments in analysing countries and their comparison in Euro terms in order to examine the cost aspect of wood sourcing.

Like for any other good, demand and supply determine the pulpwood price. Due to globalisation wood market is characterised by strong correlation between different markets and industries. For instance, strong pulp and paper industry of a country can have a great impact on pulpwood prices in its trade partner countries; strong sawmilling industry, a sub-product of which – wood chips – represents an alternative source of raw material for pulp production, can strongly affect demand for roundwood, and hence price developments. But demand-supply allocation is not the only reason for price fluctuations in forest industries.

For wood is a natural resource, unusual weather conditions can strongly affect its availability. So happened in early 2005, a storm has damaged a great area of forests in Scandinavia and the Baltic states. The unexpected high availability of wood resulted in rapid fall of roundwood prices. As can be seen from the figures 18 and 20, price developments in Sweden and Latvia show nearly the same trend in 2005 and 2006. After the damaged wood has been absorbed by the industry, the pulpwood prices recovered and were rising since then continuously because of strong demand from the pulp industry. Another example shows an opposite development. The unusually mild winter in 2007 hampered timber harvesting and removals by making forest infrastructure inaccessible. The scarcity in wood supply resulted in rapidly rising prices.

The overall trend shows constantly rising pulpwood prices all over the world. Price developments in Sweden, Russia, and Latvia for the last 5 years are shown in the figures below.

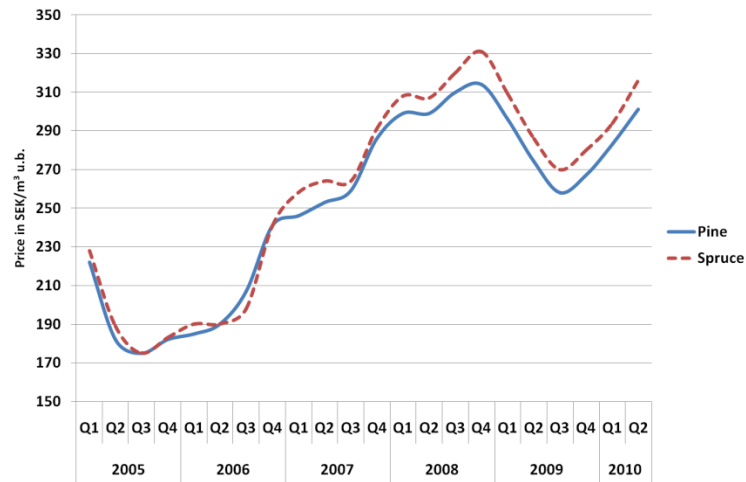


Figure 18 Coniferous pulpwood prices for pine and spruce in Sweden in SEK/m³ u.b. (Skogsstyrelsen)

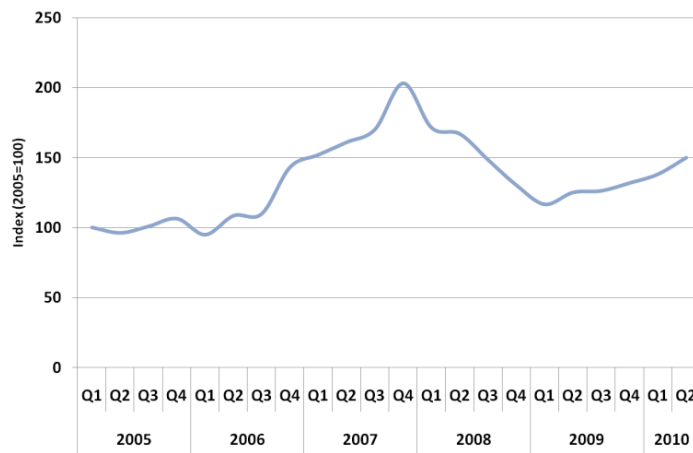


Figure 19 Coniferous pulpwood price index in North-West Russia, based on delivered log prices per m³ u.b. in local currency (UNECE/FAO 2010, LesPromKhos Ryvkin)

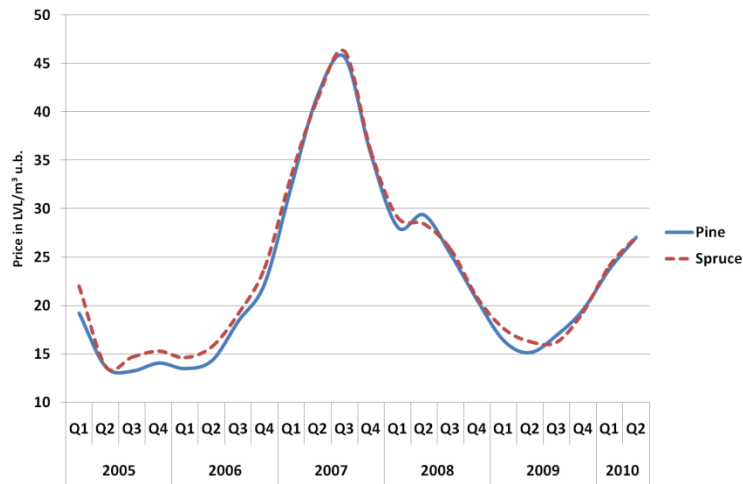


Figure 20 Coniferous pulpwood prices for pine and spruce in Latvia in LVL/m³ u.b. (Latvianwood Krasavcevs)

As the figures above illustrate pulpwood prices in local currencies or as an index, a comparison of these factors is not possible at this stage. In order to do so, the author expressed the available nominal quarterly pulpwood prices of respective countries in Euro for the period January 2009 to June 2010 using average quarterly exchange rates for respective currencies. Coniferous pulpwood in Russia is stated to be a mixture of pine and spruce pulpwood. In order to provide a comparable basis the pine and spruce pulpwood prices in Sweden and Latvia were averaged. Based on these figures (table 2), it is obvious that pulpwood prices in Russia are in average lower than in both remaining countries, the difference though not being considerable.

Table 2 A comparison of pulpwood prices expressed in €/m³ u.b. based on prices in local currency, converted using average quarterly exchange rates of respective currencies (Skogsstyrelsen; LatvianWood; LesPromKhos Ryvkin; ECB)

Period	Sweden			Latvia			Russia
	Pine	Spruce	Average value	Pine	Spruce	Average value	Coniferous pulpwood
Q2 2010	31,25	32,80	32,03	38,22	38,24	38,23	33,76
Q1 2010	28,45	29,55	29,00	33,52	33,99	33,76	26,65
Q4 2009	25,79	27,05	26,40	27,61	27,28	27,45	24,09
Q3 2009	24,74	25,89	25,32	24,09	23,08	23,59	23,22
Q2 2009	25,41	26,53	25,97	21,41	22,99	22,20	23,98
Q1 2009	27,05	28,24	27,65	23,20	24,93	24,07	21,38

At this stage it is wise to analyse the exchange rates of respective currencies against Euro as this factor has also an impact on profitability of wood sourcing from these three countries.

As can be seen from the figure below, Latvian Lats has been relatively stable against the Euro in the analysing period, which can be explained by the intended launch of Euro in Latvia. For this purpose Maastricht criteria require the exchange rate of domestic currency against Euro to remain stable.

In Sweden and Russia, on the contrary, local currencies have been exposed to fluctuations. Especially during the worldwide financial crisis Russian Rouble and Swedish Krona have weakened against Euro, which can be an additional explanation for low prices in Euro terms shown in table 2. In the beginning of 2010, both currencies began to recover triggering rising pulpwood cost from the point of view of a German company.

The overall trend of currencies exchange rates development is shown in figure 21.

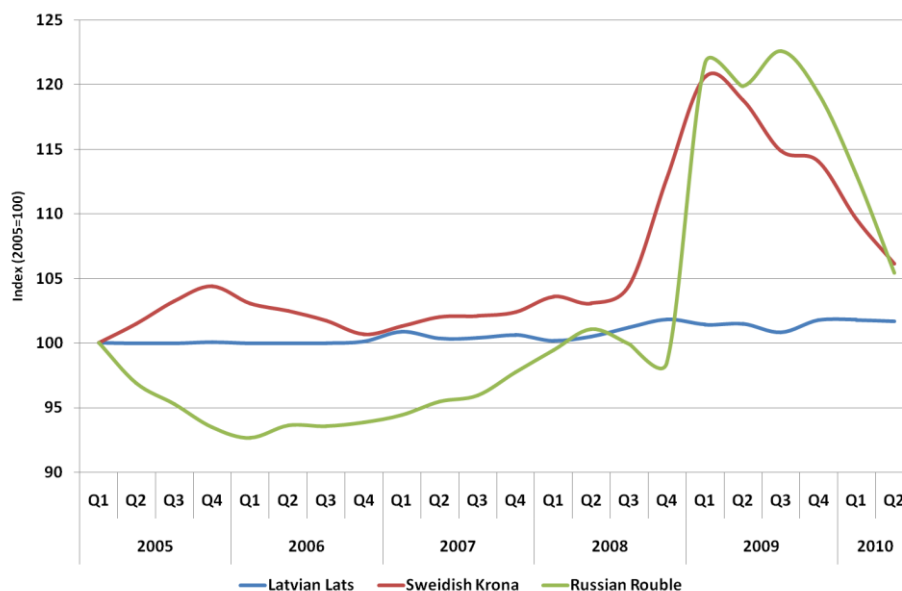


Figure 21 Exchange rates of Swedish Krona, Russian Rouble, and Latvian Lats against Euro (ECB)

6 LOGISTICS AND INFRASTRUCTURE

Logistics and infrastructure are of major importance in every industry. Logistics costs, mostly dependent on distance, contribute beside the actual product price a major part to overall procurement costs. Whereas infrastructure determines the material's availability and flexibility in wood supply, thus the lead time in procurement.

6.1 Sweden

Sweden's coastline stretches over 3 200 km, consequently the country has an impressive number of small and large ports. As it is impossible to analyse all of them within this thesis, the author picked only a few of them. The picture below illustrates the biggest ports of Sweden in regard to the forest products quantity handled in 2009. Please note that 'forest products' contain beside roundwood also processed wood and other products originating from forest.



Figure 22 Sweden's largest ports by forest products quantity handled in 2009 in thousand tons (compiled by the author based on data from Trasportgruppen, background map from Stepmap.de)

The main transportation method for export in Sweden is via sea, obviously due to country's geographical location. More than 70 percent of forest industry's products are transported by sea, but Sweden also disposes of a wide rail and road network. Rail is mainly used for transportation of sawn timber and paper products, whereas lorries are used for transporting logs from the forest to the mills or from rails and ports to the destination of further processing. About the half of all roads are forest roads built by forest owners (Figure 23) (Skogsindustrierna).

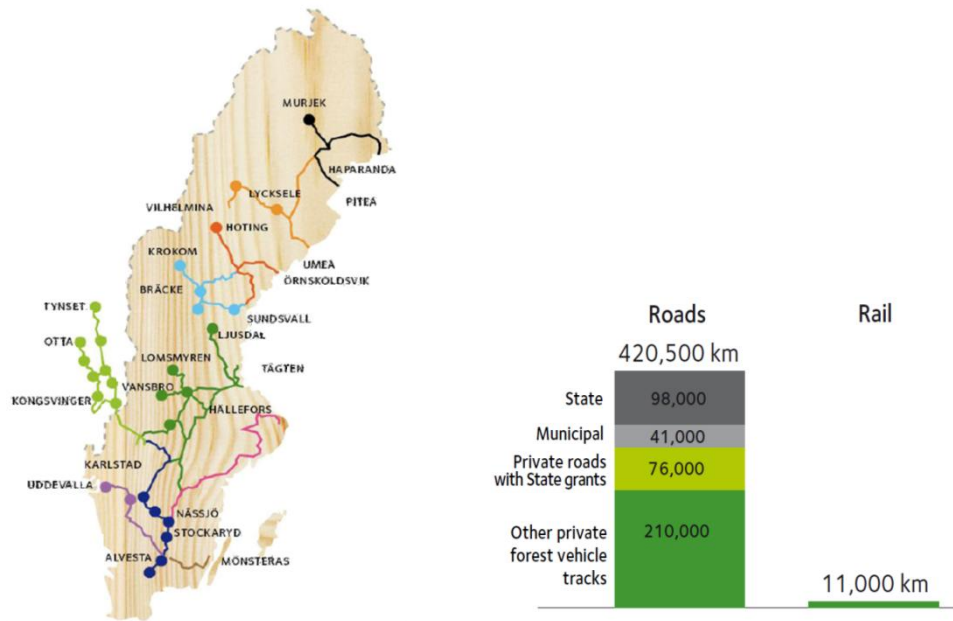


Figure 23 Swedish road and rail network (Skogsindustrierna 2010)

6.2 Russia

There are four ports along the European Russian coastline. Three of them handle wood and forest products beside other cargo types, the remainder - Primorsk port – handles only crude oil and petroleum products (Port Administration St. Petersburg). The location of all ports in North-Western Russia is illustrated in the figure 24.



Figure 24 Ports of European Russia (compiled by the author, background map from Stepmap.de)

Saint-Petersburg is the largest port in North-Western Russia, and consequently is exposed to a high congestion of cargoes. Vyborg and Ust-Luga, the latter still being under construction, offer an alternative for wood shipment.

As for the infrastructure, several organisations report of lacking forest infrastructure, and existent forest roads are in a bad condition. Studies revealed that for one hectare of forest land account approximately 1.65 km transport roads of all types, including public roads. In Europe this index is stated to be 35-40-fold (Malikova 2009). The accessibility of existent roads depends strongly on weather conditions and the average pace is assessed to be 30 km/h which tremendously affect lead time and efficiency in wood sourcing (Salminen 2008).

After the Perestroika in 1986, the state stopped financing maintenance and construction of forest roads, and delegated this responsibility to tenants of 'forest funds'. These in turn often could not afford this "luxurious indulgence". Today, after the enactment of the new Forest Code, the situation is still not resolved, primarily the question of financing: who is responsible for forest roads - the state as forest owner or the tenant as forest user? (ibid)

6.3 Latvia

Latvia is considered to be a 'gate' between Europe and CIS countries. It has 10 ports, three of which – Riga, Liepaja, and Ventspils – mostly work on transit cargoes, about 80 percent of all cargoes go through these ports. The remaining small ports operate basically as fishing and yacht ports, but also handle wood products. Approximately 10 percent of Latvian wood export is shipped through these ports (Transport Latvia).

The general condition of Latvia's road network is stated to continuously deteriorate, despite decreasing traffic density. The organisation Latvian State Roads explains this by insufficient financing in maintenance and construction sectors (Latvian State Roads). The main roads and railways are organised to facilitate transportation of any cargo – domestic and originating from the CIS - straight to the ports for shipment.

As for the forest infrastructure, the biggest forest owner LVM states to invest constantly in maintenance and expansion of forest road network to ensure efficient resources exploitation and sustainable forest management. The overall infrastructure and road structure are mapped and illustrated in the figure below.

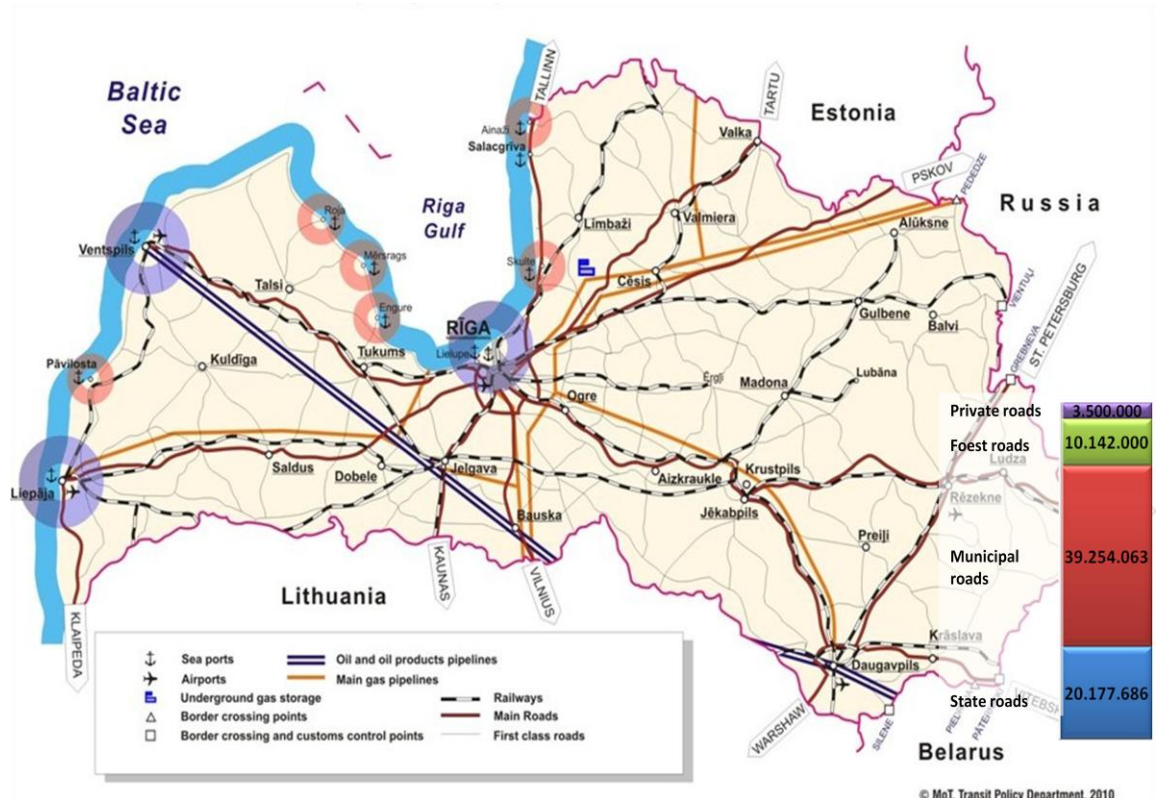


Figure 25 Latvia's infrastructure and road structure in km (Transport Latvia; Latvian State Roads)

7 CERTIFICATION

Environmental issues are getting more important in every single industry today, also in the wood industry. Based on historical developments there is a concern of global deforestation. Several non-governmental organisations address the issue of extermination of forests of high conservation value and irresponsible forestry providing certification systems to promote and support responsible forest management.

In Europe many manufacturing enterprises in forest industries are committed to environmentally friendly usage of forests raw materials as it is the only way to ensure permanent use of forests. And so did the company this thesis was written at. As a supplier for a pulp mill manufacturing certified pulp the company is obliged to source wood originating from controlled and sustainably managed forests.

This chapter aims at introducing forest certification to the reader, and examination of the extent of certified forest area and availability of certified intermediaries in selected countries as certification is the precondition of wood sourcing at the given company.

7.1 Forest management certification

Forest management certification is a process of verifying that forest and silvicultural activities meet certain standards. There are two main certification systems used in Europe – Forest Stewardship Council (FSC) and Programme for Endorsement of Forest Certification Schemes (PEFC).

FSC, starting from 1993, developed internationally accepted forest management standards based on ten principles and 56 criteria. Based on these principles and criteria national initiatives define national indicators which settle national standards in detail adapting national and regional conditions (FSC).

As of PEFC, this system acts as an umbrella. The promotion of sustainable forest management is carried out by recognition of national and regional certification schemes. In the contrast to FSC, PEFC issues certificates not to individual or a group of forest enterprises, but to country regions. Forest owners participate in certification by signing a voluntary declaration of commitment to PEFC standards (PEFC; Nussbaum and Simula 2005).

Since the foundation of PEFC there has been an argument which certification system is the best for sustainable forest management. Experts see pros and cons in both of them. Fact is, UNECE identified a tendency of large state and

industrial owners to adopt FSC certification, whereas small non-industrial private ownerships tend to adopt PEFC certification (UNECE/FAO 2009, p. 114).

Figure 25 provides an overview of certified forest area in analysing countries. In the following each country is analysed separately in more detail.



Figure 26 Extent of certified forest area in respect to total forest area in analysing countries (FSC, PEFC as of June 2010, FAO Forest Resources Assessment 2010)

7.1.2 Forest management certification in Sweden

Sweden is one of the countries with the highest extent of certified forest area. According to the certification systems' databases, more than 60 percent of Swedish forests are certified to either FSC or PEFC (Figure 26) other sources speak of nearly 80 per cent (Nordic Family Forestry). This difference is most likely due to different approach – FSC and PEFC records certified 'forest' area, whereas other sources refer to 'forest land'.

7.1.3 Forest management certification in Russia

Also Russia counts to the countries with the most certified area in the world, but in the respect to the total forest area the percentage of certified forest is marginal (Figure 26). The development of Russian forest certification has been very slow. A major reason for this is seen in Russian legislation. Enterprises trying to meet international requirements of forest certification systems are forced to

break Russian timber harvesting rules and forest legislation which results in fines. Forestry journals reported attempted adjustments of Russian legislation to international standards, but this process is perceived to be too slow (Russian Forestry Review 2006, p. 43).

FSC is the leading certification system in Russia, but also PEFC was able to make progress. In February 2010, the first PEFC certificate was issued in Leningrad federal district (UNECE/FAO 2010, p. 116).

According to UNECE/FAO (ibid), around 75 percent of total certified forests are located in the European part of Russia which can be explained by the fact that the majority of timber harvests from this region is being exported to the European market placing strict environmental requirements.

7.1.4 Forest management certification in Latvia

Latvia's forests used to be certified to both PEFC and FSC, whereby public ownerships tend to adopt FSC certification and private ownerships PEFC.

According to the official statement of PEFC from March 6, 2008, Latvian forest certification scheme is no longer PEFC recognised triggering invalidity of all PEFC forest management certificates issued by then. Since then, the Latvian forest certification scheme is undergoing the re-endorsement process (PEFC). The revised version of Latvian PEFC scheme was submitted in June this year, the assessment of which is said to not likely be finished until the beginning of 2011 (PEFC Kämmer, Ch.).

As for the FSC certification, the extent of which is illustrated in figure 26, more than a half of forest area is certified according to FSC as of June 2010. But due to recent developments the author has been forced to extend the analysing period to August 2010.

According to a press release of NEPCon, a partner of Rainforest Alliance, the FSC certification of LVM was suspended in July 2010 based on "non-

conformance findings during the annual audit in 2009 and a follow-up audit in 2010.” Responding to this suspension, LVM announced its decision to support termination of FSC certificates in Latvian state forests. The reasons are stated to be “scrupulous quality” of audits, increasing “incompetence of experts involved in audit process” while growing direct costs of certification process (LVM).

Due to these developments certified forest area in Latvia has tremendously decreased from 1 622 590 hectares in July to only 590 hectares in August 2010 making now only 0.02 percent of the total forest area.

7.2 Chain of Custody certification

Forest management certification verifies sustainable silviculture. But forest or wood itself is hardly an end-product, and needs to be processed passing multiple stages in supply chains. To ensure that certified materials are not ‘impured’ in processing, transformation, manufacturing, and distribution throughout the supply chain, all supply chain members gaining ownership of or processing certified timber have to be certified to FSC- / PEFC- Chain of Custody (CoC). So, CoC is a verifiable system of traceability of certified timber (FSC; PEFC; Nussbaum and Simula 2005).

Though the number of CoC certificates has been increasing steadily in the past years, UNECE/FAO notes that the number of CoC-certified companies to both FSC and PEFC is still too small compared to the total number of companies engaged in wood industries (2009, p. 118).

The trend of CoC certificates in the analysing countries has been illustrated in the figure below. Please note that the PEFC CoC certificates issued in Latvia have not lost its validity due to suspension of PEFC recognition of Latvian Forest Certification Scheme in 2008 (PEFC 2008).

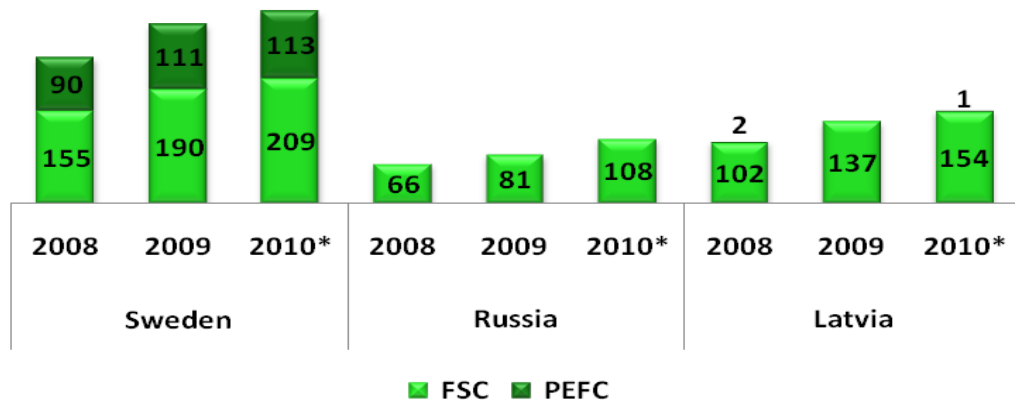


Figure 27 Chain of Custody certification trend in the analysing countries (FSC; PEFC; as of June 2010)

7.3 Controlled Wood and evaluation of Controlled Wood through the buyer

According to UNECE/FAO assessments, 26.4 percent of global roundwood supply is certified, in (Western) Europe and CIS - 14.6 percent and 0.3 percent, respectively (2010, p. 115). Consequently, it is hardly possible for a wood processing enterprise to source certified materials only.

In this case it is possible to mix certified materials with not certified ones, which in turn must avoid the following origins:

1. Illegally harvested wood
2. Wood harvested in violation of traditional and civil rights
3. Wood harvested in forests in which High Conservation Values are threatened by management activities
4. Wood harvested in forests being converted to plantations or non-forest use
5. Wood from forests in which genetically modified trees are planted

Wood meeting these requirements is referred to as 'Controlled Wood' (CW) (FSC 2006).

According to FSC Standard for company evaluation of FSC Controlled Wood, it is in buyer's obligation to assess the risk of sourcing controversial wood. For this purpose there are some tools developed by several environmental organisations approved by FSC. One of these is NEPCo which provides a global forest risk registry and maps of high risk areas of more than 150 countries, though these data are for guidance only. It is the duty of the buying company to verify that the purchased wood meets requirements set by the FSC standard. This means companies sourcing from non FSC or FSC CW certified suppliers have to keep record of all suppliers and quantity of wood supplied, and maintain documentation demonstrating district of materials' origin and transportation.

In the case of within this thesis analysing countries the risk hotspots are located as illustrated in the figure below where red indicates high risk areas.

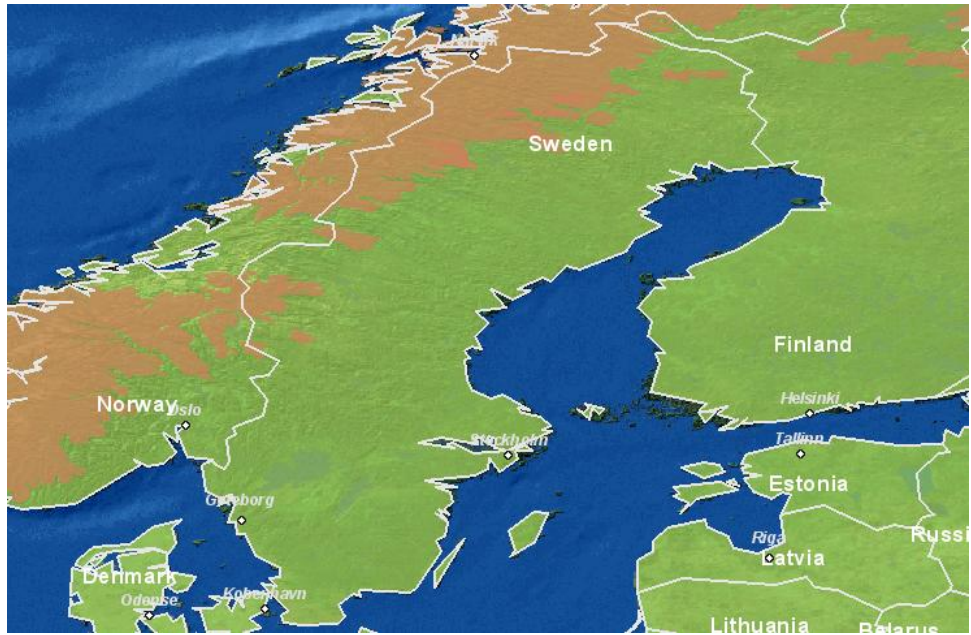


Figure 28 Risk area maps of analysing countries. (NEPCon)

Additionally, NEPCon provides a risk assessment for each of the categories set by the FSC Standard for company evaluation of Controlled Wood. The summary of this risk assessment is provided in table 3 where green indicates low risk and red – high risk.

Table 3 Risk assessment for Controlled Wood in analysing countries. (NEPCon)

Category	Sweden	Russia	Latvia
Illegally Harvested Wood	●	●	●
Wood harvested in violation of traditional or civil rights	●	●	●
Wood harvested from forest in which high conservation values are threatened by management activities	●	●	●
Wood harvested from areas being converted from forests and other wooded ecosystems to plantations or non-forest uses	●	●	●
Wood from forests in which genetically modified trees are planted	●	●	●
Total	●	●	●

Applying this assessment on Sweden, a company sourcing wood from South-Sweden, would have to prove that the purchased wood does not origin from forests of high conservation value (the only high-risk category in table 3). For this purpose it can use documentations of material's origin recording harvesting in South-Sweden and none of the red indicated areas on the risk map.

According to the table above, Russia is the only country with more than one high-risk category. Indeed, there have been reports on illegally harvested wood accounting for 11 percent referring to official data, while unofficial data reveals figures of 20-30 percent only in export, in domestic harvesting illegal logging is said to be around 50 percent (Dmitriev 2006). This rate is the highest world-wide.

Other critical issues with regard to criminality in Russia are disposal of wood on false documents; using same permissive documents e.g. harvesting licence for several suppliers just by copying them; and wood disposal through very long supply chains making tracing of material's origin impossible (Kurochkina 2010).

7.4 Drivers for certification

Certification is a process consuming time and money. Despite that, more and more forest owners and companies get certified. Even during and after the global financial crisis the number of issued certificates has been increasing. So what is the driving power behind certification in wood working industries?

Certification is mostly demand driven. Be it green public procurement, policies supporting environmentally friendly building or aiming at minimising illegal logging activities, all these factors have a great impact on certification. But the probably most significant factor driving growth in forest and chain of custody certification is paper, publishing, printing and packaging sector. Commitment of large publishers and other players in paper sector drives certification back through the supply chain: from pulp and paper mills, over wood sourcing companies, to forest owners, not to mention all intermediaries in between (UN-ECE/FAO 2010, p.122).

8 WOOD SOURCING IN PRACTICE – INTERVIEW

As has already been mentioned before, the author did an internship at a wood sourcing company in Germany. In order to examine wood sourcing in practice, and to analyse the impacts of sourcing affecting factors an interview has been done with the head of roundwood department in this company.

The interview's purpose is to bring in a practical aspect to this thesis through describing how factors analysed in previous chapters affect wood sourcing in every-day business. The interviewee has been asked questions regarding im-

pact of factors such as forest ownership, industry, prices, logistics, as well as wood certification. At this stage, the author makes the first conclusions regarding respective factors for Sweden, Russia and Latvia applying the interview's outcomes to the theory analysis from previous chapters.

The company's main operation area is Germany, but due to high competition, which negatively affects availability of domestic wood, there is a need to source abroad. The import operation has been started in early 2006, which coincides with the storms in Scandinavia and the Baltic States. Due to its shape the damaged wood could only be classified as industrial roundwood, moving a great amount onto the market and triggering very low pulpwood prices. This fact has made the launch of company's import operation as advantageous as ever. In mid-2007 another storm hit Germany, and the freed-up capacity of domestic raw material market could fully cover the company's demand making sourcing from abroad unnecessary. In the course of time a scarcity in wood supply evolved, and in mid-2009 the company had to resort to wood from abroad again. Suppliers from Sweden, Latvia and Russia have been trading partners during this time, among other countries. According to this information, the company has import experience of about three years.

Forest resources of a country determine the availability of wood for domestic processing, and dependent on status of local industries, the extent of raw material to be exported. Chapter 3 already described the vast forest resources of Sweden, Russia and Latvia, and there is no need to amplify this aspect any further.

Chapter 3 has also shown that forest ownership differentiates between two main types – public and private. This has an important effect on wood sourcing. In order to understand the impact of forest ownership the reader has to know first how these organisations run their business.

Public forest organisations are run according to a management plan that defines two essential factors – the annual cut and the annual revenue. The annual cut is set within the framework of sustainable annual allowable cut for the whole

country, which is determined by the local forestry legislation in order to ensure sustainable forest management. Revenue budget is relevant for the taxes to be paid. This figure is often set by local financial organisations based on experience values from former periods. Public institutions are not interested in exceeding either of both factors for it triggers ramifications for the following periods, meaning exceeding the annual cut follows by cuts in removals for the following period, whereas exceeding the budgeted revenue triggers increased tax duties and the likelihood of budget to be raised in the following period.

This is also the reason for the very untypical market behaviour of public forest ownerships. They are featured by decreasing supply while increasing prices in order to not exceed the annual budgeted revenue. Furthermore, public organisations are perceived to be very stiff in terms of wood supply due to strict definitions in the management plan. Private forest ownerships, on the contrary, act as 'normal' market players. Due to profit orientation they are characterised by increasing supply while increasing market prices, and vice versa. So, in order to provide an optimal sourcing environment a country should have both ownership types in a well-balanced manner.

Applying this information on Sweden, Russia and Latvia, it is obvious that Latvia and Sweden offer a relatively flexible environment. The ownership types are soundly balanced in a ratio of 52/48 in Sweden, and 54/46 in Latvia for public and private ownerships, respectively. Though about 95% of Russian forests are publically owned, the state leases the so called 'forest fund' to private entities. Hence, Russia can be seen represented by both ownership types in a greater ratio towards private, though maybe not according to statutory definition of ownership.

The next factor affecting wood sourcing and wood availability is logically domestic industry. Chapter 4 identified Sweden to have the most developed forest industries. Consequently, there is a greater demand for wood than country's forest resources can provide. In fact, the interviewee stated the company experiencing slight reluctance of Swedish merchants regarding roundwood export. Despite the constantly increasing growing stock, the roundwood balance is not

likely to turn as forest industries in Sweden keep developing, and the domestic demand for forest products, especially in the pulp and paper industry, is forecasted to rise in the next future.

Based on the previous chapters, Latvia and Russia proved to not be capable of processing the amount of available wood supply through rather weak domestic industries. According to statements made in the interview, this situation is not likely to change from mid- to long-term. Consequently, it can be concluded that Latvia and Russia will keep their status as mainly exporting countries of roundwood in the long-term.

As for the cost aspect wood price, chapter 5 identified the overall trend of rising pulpwood prices. Forest products market and timber market are seen to be self-balanced. As stated by the interviewee, there is hardly a market player capable of influencing wood market prices. Thus, the market price is accepted as given, though being the most important subject to negotiations while contracting. The theory analysis showed raw material prices exposed to massive fluctuations in the period of the last five years. In order to avoid these fluctuations in the short term, as well as to minimise the administrative effort, in practice it is usual to contractually set a fixed price for a period of 3-6 months. However, this works only in the short term. Due to actual level of export taxes in Russia, even if the final increase will never be implemented, a scarcity in wood supply on the European market will be the most likely consequence in the long-term triggering increasing pulpwood prices along all Europe.

Another cost affective factor is logistics. Considering the geographical location of all three countries, it can be concluded that sourcing from Sweden is most cost effective, whereas Russia is furthestmost country analysing in this thesis. This results in high logistical costs, as stated by the head of the roundwood department at the given company, that cannot be compensated by the level of wood prices as assumed prior to the analysis as theory study proved the difference between those in the analysing countries to be as not as high as expected. Already at this point sourcing from Russia seems to be not profitable.

Additional factor to be analysed at this stage is the number of logistical facilities and shape of local infrastructure. The company has experienced merchants delivering from same facilities to communicate about prices, which has consequences for future contracting and can severely affect price negotiations. Furthermore, shortage in logistic facilities can lead to development of monopolistic structures making entry of a market very difficult. According to chapter 6, Sweden provides the greatest flexibility in terms of logistic facilities and infrastructure. Latvia has three main ports for wood shipment, but offers seven additional small ports as an alternative. Russia, however, provides only a small number of ports in the European part of the country and disposes of an insufficient infrastructure, especially in the forest sector which can tremendously affect lead time and wood availability in future, unless major investments are made in this sector.

The last and probably the most important factor is certification. The company is committed to sourcing wood from certified or controlled sources only. Thus, certification represents a premise for sourcing at the case company. The interview has proved the already stated lack of both, forest and CoC certification in Russia, and tracing of certified material being very difficult as delivery chains are too long and complex. Furthermore, in case of sourcing Controlled Wood the company has been experiencing difficulties in receiving necessary documents required by the FSC Standard for evaluation of Controlled Wood through the buyer. One major obstacle in this being language barriers. If the necessary documents were provided then only in Russian, which means additional administrative effort. An additional problem in Russia stated by the interviewee is corruption. According to Transparency International – the international coalition against corruption, Russia's Corruption Perception Index (CPI) amounted to 2.2 in 2009 on the scale from 10 (level of corruption being perceived very low) and 0 (level of corruption being perceived very high). As corruption can hardly be proved, Controlled Wood from Russia bears a risk of being originating from illegal sources, which cannot be accepted under FSC Controlled Wood regulation.

In case of Latvia, the theory analysis has shown the country losing its PEFC certification in 2008, and FSC certification of the biggest forest owner LVM in

July 2010. This is perceived not being such a big problem, as Latvia endeavours to successfully finish the re-endorsement process of PEFC until the beginning of 2011, and in case of LVM, wood can be conveniently sourced as CW for LVM, as a state organisation, is obliged to gapless documentation.

Sweden has been identified as the country with the biggest certified forest area and the highest number of CoC certificates issued by June 2010. Indeed, the given company has been experiencing the least problems in either sourcing certified materials or acquiring necessary documents as this process is common in Swedish industries and every member of the supply chain is willing to cooperate.

9 FINDINGS

Despite vast forest resources and weak domestic industry in Russia which is advantageous for sourcing from the point of view of a German company, the author identified major weaknesses that have been proved by the interview. The first point speaking against Russia being a trading partner is the insufficient forest certification and CoC certification, which is a premise at the given company. The alternative – sourcing of Controlled Wood – has been identified as hardly possible due to high corruption level, and tracing of wood origin not being comprehensive as well as inefficient in regard to administrative effort. The cost aspect – raw material price and logistics costs – turned out to be unprofitable as the difference between prices in Sweden and Latvia is too low to compensate higher logistics costs dependent on greater distance to Russia. Additional obstacle in overall purchasing costs is the export tax on unprocessed roundwood actually amounting to 25 percent of the purchasing price or at least 15€ per cubic metre. These three factors make sourcing from Russia most expensive among the three analysed countries. Other reasons of minor importance speaking against Russia are insufficient number of logistics facilities for wood shipments; lack of forest infrastructure that can affect lead time and wood availabil-

ity, which in turn can trigger higher prices in the long-term; as well as instable and unpredictable forest legislation.

Sweden appears to be the most cost effective sourcing partner as the price level compared with Latvia is nearly the same, but the close location offers an advantage in regard to logistics costs which contribute a major part to total purchasing costs. Furthermore, Sweden provides a very flexible environment in respect to logistical facilities and forest ownership types, as well as a sufficient certification. However, the strong, and still developing, domestic forest industry will probably restrict the extent of wood available for exports in the long-term. A possible solution for the future could be increased sourcing of wood chips as an alternative raw material for pulp production. However, this should be subject to further analysis that is not intended to be dealt with within this thesis.

As for Latvia, based on this analysis the country provides the optimal sourcing environment from the author's point of view. Pulpwood prices in combination with logistics costs seem to be acceptable costs for wood sourcing. The shape of domestic forest industries allows exporting of sufficient amount of raw materials. Though certification is not fully provided, the country complies with conditions for sourcing of Controlled Wood set by the FSC standards. Additionally, the re-endorsement of Latvian PEFC Scheme is scheduled for the beginning of 2011. In terms of logistics facilities, Latvia disposes of three major ports and seven smaller ports which can be an alternative for wood shipments in case of congestion or suspected 'supplier communication'.

10 CONCLUSION

The aim of this thesis was to analyse factors having impact on sourcing of coniferous pulpwood which represents a raw material for pulp production. During an internship at a wood sourcing company in Germany the author identified five factors of major importance for wood sourcing – country's forest resources, domestic forest industries, domestic raw material market, logistics and infrastructure, as well as certification. Defining the scope of the thesis three countries

were selected that have a major importance for the given company – Sweden and Latvia – or representing a market the company has only few importing experiences in and needs a further analysis – Russia.

The analysis is based on publications of international and regional forestry organisations and forestry statistics. During the research the author was confronted with a surprising phenomenon – the more developed local industries were, the less information about it was available, meaning Russian forest industry identified as the weakest among in this thesis analysed countries is described in detail with all its problems and potentials, whereas it was hardly possible to find any useful freely accessible information on Swedish and Latvian industries. Regarding forestry statistics the situation turned out to be the opposite. Swedish and Latvian forest organisations provide statistics in a very detailed manner, Russian state statistics, on the contrary, proved to be out of date and rather scarce. Another major problem regarding statistics turned out to be the documentation of pulpwood. Pulpwood is a subgroup of industrial roundwood, which is barely recorded in the way the given analysis requires either by national or international forestry statistics.

After the theoretical study analysing the situation in the selected countries, the author decided to bring in experiences of the training company as empirical study, which was meant to provide an example on the type of impact the identified factors can have while wood sourcing at an international level. For this purpose the head of the roundwood department of the training company has been interviewed. The interview's outcomes were applied to the theory analysis in order to examine which of the selected countries has the greatest potential and the optimal sourcing environment.

The analysis revealed Russia to be the least profitable source in virtue of wood prices being too high to compensate higher logistics costs dependent on the country's furthest geographical location in respect to Germany. An additional cost factor speaking against Russia was identified to be the increased export tax on unprocessed roundwood recently launched by the Russian legislation in order to promote development of domestic forest industries and to encourage foreign investment. Furthermore, Russia does not dispose of sufficient

certified forest area and intermediaries which is a premise for wood sourcing at the given company, and the alternative sourcing of Controlled Wood proved to be very difficult based on high corruption and flawed provision of required documentation. Sweden, on the contrary, fulfils all the requirements regarding certification, availability of necessary logistical facilities, and profitability of wood sourcing due to close geographical location. However, based on the strong forestry industry Sweden's wood supply to foreign markets is seen to be restricted. Considering this fact, a review of alternative sourcing such as wood chips appears to be wise. Based on this analysis and on the author's given market knowledge, Latvia was identified as the optimal market for wood sourcing. Considering its rather weak forest industries compared with vast forest resources the country possesses a great potential of being roundwood exporter in the long-term.

This analysis was conducted for the purpose of examination of market environment, whereas the extent of analysis of cost affective factors is rather small. The used data regarding pulpwood prices represents statistical records and does not reveal the real purchasing costs at the given company. In order to completely cover the detailed analysis of import profitability of a country a further analysis of purchasing costs is recommendable, which cannot be conducted within this thesis due to confidentiality.

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REFERENCES

Books

Hague, P.N., Hague, N. 2004. Market Research in Practice: A Guide to the Basics. Kogan Page. London, United Kingdom

Nussbaum, R., Simula, M. 2005. Forest Certification Handbook 2ed. Earthscan Canada. London, United Kingdom

Publication series

Chuko, V. 2007. Actual problems of development of the Russian pulp and paper industry. In Russian Forestry Review 2007 pp. 134-139. LesPromInform. Saint-Petersburg, Russia

Dmitriev, D. 2006. The Russian timber industry – past, present, and future. In Russian Forestry Review 2006 pp. 8-15. LesPromInform. Saint-Petersburg, Russia

Federal Forestry Agency of Russian Federation. 2006. Russian forests. In Russian Forestry Review 2006 pp. 35-41. LesPromInform. Saint-Petersburg, Russia

Latvian State Roads. 2009. Latvian State Roads Yearbook. Latvian State Roads. Riga, Latvia

Russian Forestry Review 2006. Forest certification: Russia among the top actors. pp. 42-48. LesPromInform. Saint-Petersburg, Russian Federation

Russian Forestry Review 2007. Map of Russia's forests. p. 52. LesPromInform. Saint-Petersburg, Russian Federation

Russian Forestry Review 2008. Russia's role in the global forestry sector and its prospects for the future. LesPromInform. Saint-Petersburg, Russia

Ryvkin, I. 2007. New Russian "Forest Government". In Russian Forestry Review 2007 pp. 28-32. LesPromInform. Saint-Petersburg, Russia

Skogsindustrierna. 2010. The Swedish forest industry – facts and figures 2009. Swedish Forest Industries Federation. Sweden

UNECE/FAO. 2008. Forest products annual market review 2007-2008. United Nations. New York, USA and Geneva, Switzerland

UNECE/FAO. 2009. Forest products annual market review 2008-2009. United Nations. New York, USA and Geneva, Switzerland

UNECE/FAO. 2010. Forest products annual market review 2009-2010. United Nations. New York, USA and Geneva, Switzerland

Yaroshenko, A. 2007. The new Russian Forest Code: a review. In Russian Forestry Review 2007 pp.62-69. LesPromInform. Saint-Petersburg, Russia

Journals

Grevzov, A. (Гревцов, А.). 2007. Потенциал-огромен. Реальность-удручает! In LesPromInform vl 9 pp. 12-19. LesPromInform. Saint-Petersburg, Russia

Kurochkina, O. (Курочкина, О.) 2010. Лес возьмут под контроль. In LesPromInform vl. 1 pp. 68-70. LesPromInform. Saint-Petersburg, Russia

Malikova, G. (Маликова, Г.). 2009. Настоящее и будущее лесных дорог. In LesPromInform vl. 6, pp. 8-10. LesPromInform. Saint-Petersburg, Russia

Salminen, E. 2008. На нефтяной игле-закупорка экономических артерий. In LesPromInform vl. 1, pp. 20-22. LesPromInform. Saint-Petersburg, Russia

Zudrags, K. (Зудрагс, К.). 2009. Лесные будни Латвии. In LesPromInform vl.8 pp. 164-167. LesPromInform. Saint-Petersburg, Russia

Publications

FSC. 2006. FSC-STD-40-005 (Version 2-1) – Standard for company evaluation of FSC Controlled Wood. FSC. Bonn, Germany

SkogsIndustrierna. 2008. The forest industry – natural part of Sweden.

Internet sources

FAO Country Profiles. <http://www.fao.org/forestry/country/en/> (accessed on 22 August 2010)

FSC – About FSC. <http://www.fsc.org/about-fsc.html> (accessed on 19 July 2010)

LVM – Latvijas Valsts Mezi. About Forest. http://www.lvm.lv/eng/our_forests/about_forest/ (accessed on 29 September 2010)

LVM – Latvijas Valsts Mezi. Forest Infrastructure. http://www.lvm.lv/lat/profesionaliem/kokmaterialu_parvadajumi/ (accessed on 10 October 10)

LVM – Latvijas Valsts Mezi. LVM supports termination of FSC certificate in Latvian state forests. http://www.lvm.lv/eng/for_press/press_releases/?doc=12613 (accessed on 5 October 2010)

NEPCon. Global Forest Risk Registry. <http://globalforestrisk.nepcon.net/> (accessed on 8 October 2010)

NEPCon. Press release 12 August 2010. FSC certification on Latvian State Forests suspended.
http://www.nepcon.net/3594/English/HOME/News_2010/August/FSC_certification_of_the_Latvian_State_Forests_suspended/ (accessed on 5 October 2010)

Nordic Family Forestry. Forests in Sweden.
<http://www.nordicforestry.org/facts/Sweden.asp> (accessed on 13 September 2010)

PEFC Press release. Latvian Certification Scheme no longer PEFC recognised.
<http://www.pefc.org/news-a-media/general-sfm-news/news-detail/item/80-latvian-certification-scheme-no-longer-pefc-recognised> (accessed on 7 October 2010)

PEFC – Who we are. <http://pefc.org/about-pefc/who-we-are> (accessed on 20 July 2010)

Port Administration St.Petersburg. Официальная информация.
http://www.pasp.ru/bolshoy_port_sankt-peterburg1 (accessed on 22 September 2010)

Skogsstyrelsen – Swedish Forest Agency
<http://www.skogsstyrelsen.se/episerver4/templates/SNormalPage.aspx?id=11310> (accessed on 24 August 2010)

Transparency International – the global coalition against corruption. Corruption Perception Index 2009.
http://www.transparency.org/policy_research/surveys_indices/cpi/2009/cpi_2009_table (accessed on 14 November 2010)

Transport Latvia. <http://www.transport.lv/?sadala=210> (accessed on 9 September 2010)

Statistics

European Central Bank (ECB) Euro exchange rates
(<http://sdw.ecb.europa.eu/browse.do?node=2018794>) (accessed on 30 September 2010)

FAO. Forest Resources Assessment 2010 Country Reports.
<http://www.fao.org/forestry/62318/en/> (accessed on 12 September 2010)

FSC Global Certificates December 2008. http://www.fsc.org/fileadmin/web-data/public/document_center/powerpoints_graphs/facts_figures/Global_FSC_certificates-2009-12-15.pdf (accessed on 22 July 2010)

FSC Global Certificates December 2009. http://www.fsc.org/fileadmin/web-data/public/document_center/powerpoints_graphs/facts_figures/Global_FSC_certificates-2008-12-31.pdf (accessed on 22 July 2010)

FSC Global Certificates June 2010. http://www.fsc.org/fileadmin/web-data/public/document_center/powerpoints_graphs/facts_figures/Global-FSC-Certificates-2010-05-15-EN.pdf (accessed on 22 July 2010)

FSC Global Certificates July 2010. http://www.fsc.org/fileadmin/web-data/public/document_center/powerpoints_graphs/facts_figures/Global-FSC-Certificates-2010-07-15-EN.pdf (accessed on 5 October 2010)

FSC Global Certificates August 2010. http://www.fsc.org/fileadmin/web-data/public/document_center/powerpoints_graphs/facts_figures/Global-FSC-Certificates-2010-08-16-EN.pdf (accessed on 5 October 2010)

Latvian State Roads. Latvia's Roads <http://www.lvceli.lv/en/?i=15> (accessed on 14 October 2010)

PEFC Council information register. <http://register.pefc.cz/statistics.asp> (accessed on 20 July 2010)

UNECE Forest products statistics. <http://timber.unece.org/fileadmin/DAM/statsdata/fps05-09.pdf> (accessed on 14 October 2010)

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JOINT FOREST SECTOR QUESTIONNAIRE

DEFINITIONS (Extract)

General terms

C Coniferous

All woods derived from trees classified botanically as Gymnospermae, e.g. *Abies* spp., *Araucaria* spp., *Cedrus* spp., *Chamaecyparis* spp., *Cupressus* spp., *Larix* spp., *Picea* spp., *Pinus* spp., *Thuja* spp., *Tsuga* spp., etc. These are generally referred to as softwoods.

NC Non-coniferous

All woods derived from trees classified botanically as Angiospermae, e.g. *Acer* spp., *Dipterocarpus* spp., *Entandrophragma* spp., *Eucalyptus* spp., *Fagus* spp., *Populus* spp., *Quercus* spp., *Shorea* spp., *Swietonia* spp., *Tectona* spp., etc. These are generally referred to as broadleaves or hardwoods.

NC.T Tropical

Tropical timber is defined in the International Tropical Timber Agreement (1994) as follows: "Non-coniferous tropical wood for industrial uses, which grows or is produced in the countries situated between the Tropic of Cancer and the Tropic of Capricorn. The term covers logs, sawnwood, veneer sheets and plywood ... in some measure conifers of tropical origin shall also be covered by the definition." For the purposes of this questionnaire, tropical sawnwood, veneer sheets and plywood shall also include products produced in non-tropical countries from imported tropical roundwood. Please indicate if statistics provided under "tropical" in this questionnaire may include species or products beyond the scope of this definition.

Transactions

Removals

The volume of all trees, living or dead, that are felled and removed from the forest, other wooded land or other felling sites. **It includes** natural losses that are recovered (i.e. harvested), removals during the year of wood felled during an earlier period, removals of non-stem wood such as stumps and branches (where these are harvested) and removal of trees killed or damaged by natural causes (i.e. natural losses), e.g. fire, windblown, insects and diseases. Please note that this includes removals from all sources within the country including

public, private, and informal sources. **It excludes** bark and other non-woody biomass and any wood that is not removed, e.g. stumps, branches and tree tops (where these are not harvested) and felling residues (harvesting waste). **It is reported in** cubic metres solid volume underbark (i.e. excluding bark). Where it is measured overbark (i.e. including bark), the volume has to be adjusted downwards to convert to an underbark estimate.

Production

The solid volume or weight of all production of the products specified below. **It includes** the production of products that may immediately be consumed in the production of another product (e.g. wood pulp, which may immediately be converted into paper as part of a continuous process). Please note that this includes production from all sources within the country including public, private, and informal sources. **It excludes** the production of veneer sheets that are used for plywood production within the same country. **It is reported** in cubic metres of solid volume in the case of roundwood, sawnwood and wood based panels and metric tonnes in the case of charcoal, pulp and paper products.

Imports (Quantity, Value)

Products imported for domestic consumption or processing shipped into a country. **It includes** imports for re-export. **It excludes** "in-transit" shipments. **It is reported** in cubic metres of solid volume or metric tonnes and values normally include cost, insurance and freight (i.e. CIF).

Exports (Quantity, Value)

Products of domestic origin or manufacture shipped out of the country. **It includes** re-exports. **It excludes** "in-transit" shipments. **It is reported** in cubic metres of solid volume or metric tonnes and values are normally recorded as free-on-board (i.e. FOB).

Products

The names of individual forest products and product aggregates are listed below in the order in which they occur in the tables later on. Separate definitions are not provided for coniferous (C) and non-coniferous (NC) components where the general definition given above applies. Unless indicated otherwise, each forest product category includes both coniferous and non-coniferous components.

- 1. **ROUNDWOOD**
- 1.C **Coniferous**
- 1.NC **Non-Coniferous**

All roundwood felled or otherwise harvested and removed. It comprises all wood obtained from removals, i.e. the quantities removed from forests and from trees

outside the forest, including wood recovered from natural, felling and logging losses during the period, calendar year or forest year. **It includes** all wood removed with or without bark, including wood removed in its round form, or split, roughly squared or in other form (e.g. branches, roots, stumps and burls (where these are harvested) and wood that is roughly shaped or pointed. **It is an aggregate comprising** wood fuel, including wood for charcoal and industrial roundwood (wood in the rough). **It is reported in** cubic metres solid volume underbark (i.e. excluding bark).

1.1 WOOD FUEL (INCLUDING WOOD FOR CHARCOAL)

1.1.C Coniferous

1.1.NC Non-Coniferous

Roundwood that will be used as fuel for purposes such as cooking, heating or power production. **It includes** wood harvested from main stems, branches and other parts of trees (where these are harvested for fuel) and wood that will be used for charcoal production (e.g. in pit kilns and portable ovens). The volume of roundwood used in charcoal production is estimated by using a factor of 6.0 to convert from the weight (mt) of charcoal produced to the solid volume (m³) of roundwood used in production. It also includes wood chips to be used for fuel that are made directly (i.e. in the forest) from roundwood. **It excludes** wood charcoal. **It is reported in** cubic metres solid volume underbark (i.e. excluding bark).

1.2 INDUSTRIAL ROUNDWOOD (WOOD IN THE ROUGH)

1.2.C Coniferous

1.2.NC Non-Coniferous

1.2.NC.T of which tropical

All roundwood except wood fuel. **In JQ1, it is an aggregate comprising** sawlogs and veneer logs; pulpwood, round and split; and other industrial roundwood. **It is reported in** cubic metres solid volume underbark (i.e. excluding bark). The customs classification systems used by most countries do not allow the division of Industrial Roundwood *trade* statistics into the different end-use categories that have long been recognized in *production* statistics (i.e. sawlogs and veneer logs, pulpwood and other industrial roundwood). Thus, these components do not appear in JQ2. Category 1.2.NC.T does not appear in JQ1 as only minimal quantities of tropical industrial roundwood are removed from countries classified as non-tropical (i.e. Australia, China) and all non-coniferous removals in tropical countries fall into this category by definition. **It excludes:** telephone poles.

1.2.1 SAWLOGS AND VENEER LOGS

1.2.1.C Coniferous

1.2.1.NC Non-Coniferous

Roundwood that will be sawn (or chipped) lengthways for the manufacture of sawnwood or railway sleepers (ties) or used for the production of veneer (mainly by peeling or slicing). **It includes** roundwood (whether or not it is roughly squared) that will be used for these purposes; shingle bolts and stave bolts; match billets and other special types of roundwood (e.g. burls and roots, etc.) used for veneer production. **It is reported in** cubic metres solid volume underbark (i.e. excluding bark).

1.2.2 PULPWOOD, ROUND AND SPLIT

1.2.2.C Coniferous

1.2.2.NC Non-Coniferous

Roundwood that will be used for the production of pulp, particleboard or fibreboard. **It includes:** roundwood (with or without bark) that will be used for these purposes in its round form or as splitwood or wood chips made directly (i.e. in the forest) from roundwood. **It is reported in** cubic metres solid volume underbark (i.e. excluding bark).

1.2.3 OTHER INDUSTRIAL ROUNDWOOD

1.2.3.C Coniferous

1.2.3.NC Non-Coniferous

Industrial roundwood (wood in the rough) other than sawlogs, veneer logs and/or pulpwood. **It includes** roundwood that will be used for poles, piling, posts, fencing, pitprops tanning, distillation and match blocks, etc. **It is reported in** cubic metres solid volume underbark (i.e. excluding bark).

2 WOOD CHARCOAL

Wood carbonised by partial combustion or the application of heat from external sources. **It includes** charcoal used as a fuel or for other uses, e.g. as a reduction agent in metallurgy or as an absorption or filtration medium. **It is reported in** metric tonnes.

3 CHIPS AND PARTICLES

Wood that has been reduced to small pieces and is suitable for pulping, for particle board and/or fibreboard production, for use as a fuel, or for other purposes. **It excludes** wood chips made directly in the forest from roundwood (i.e. already counted as pulpwood, round and split). **It is reported in** cubic metres solid volume excluding bark.

4 WOOD RESIDUES

The volume of roundwood that is left over after the production of forest products in the forest processing industry (i.e. forest processing residues) and that has not been reduced to chips or particles. **It includes** sawmill rejects, slabs, edgings

and trimmings, veneer log cores, veneer rejects, sawdust, residues from carpentry and joinery production, etc. **It excludes** wood chips made either directly in the forest from roundwood or made from residues (i.e. already counted as pulpwood, round and split or wood chips and particles). **It is reported in** cubic metres solid volume excluding bark.

5 SAWNWOOD

5.C Coniferous

5.NC Non-Coniferous

5.NC.T of which tropical

Wood that has been produced from both domestic and imported roundwood, either by sawing lengthways or by a profile-chipping process and that exceeds 6 mm in thickness. **It includes** planks, beams, joists, boards, rafters, scantlings, laths, boxboards and "lumber", etc., in the following forms: unplaned, planed, end-jointed, etc. **It excludes** sleepers, wooden flooring, mouldings (sawnwood continuously shaped along any of its edges or faces, like tongued, grooved, rebated, V-jointed, beaded, moulded, rounded or the like) and sawnwood produced by resawing previously sawn pieces. **It is reported in** cubic metres solid volume.

6 WOOD-BASED PANELS

In JQ1 and JQ2, this product category is an aggregate comprising veneer sheets, plywood, particle board, and fibreboard. **It is reported in** cubic metres solid volume.

6.1 VENEER SHEETS

6.1.C Coniferous

6.1.NC Non-Coniferous

6.1.NC.T of which tropical

Thin sheets of wood of uniform thickness, not exceeding 6 mm, rotary cut (i.e. peeled), sliced or sawn. **It includes** wood used for the manufacture of laminated construction material, furniture, veneer containers, etc. **Production statistics should exclude** veneer sheets used for plywood production within the same country. **It is reported in** cubic metres solid volume.

6.2 PLYWOOD

6.2.C Coniferous

6.2.NC Non-Coniferous

6.2.NC.T of which tropical

A panel consisting of an assembly of veneer sheets bonded together with the direction of the grain in alternate plies generally at right angles. The veneer sheets are usually placed symmetrically on both sides of a central ply or core that may itself be made from a veneer sheet or another material. **It includes** veneer plywood (plywood manufactured by bonding together more than two veneer

sheets, where the grain of alternate veneer sheets is crossed, generally at right angles); *core plywood* or *blockboard* (plywood with a solid core (i.e. the central layer, generally thicker than the other plies) that consists of narrow boards, blocks or strips of wood placed side by side, which may or may not be glued together); *cellular board* (plywood with a core of cellular construction); and *composite plywood* (plywood with the core or certain layers made of material other than solid wood or veneers). **It excludes** laminated construction materials (e.g. glulam), where the grain of the veneer sheets generally runs in the same direction. **It is reported in** cubic metres solid volume. Non-coniferous (tropical) plywood is defined as having at least one face sheet of non-coniferous (tropical) wood. If substantial quantities of mixed (coniferous/non-coniferous) plywood are included in reported statistics, an explanatory note should be provided.

6.3 ***PARTICLE BOARD, ORIENTED STRANDBOARD (OSB) AND SIMILAR BOARD***

A panel manufactured from small pieces of wood or other ligno-cellulosic materials (e.g. chips, flakes, splinters, strands, shreds, shives, etc.) bonded together by the use of an organic binder together with one or more of the following agents: heat, pressure, humidity, a catalyst, etc. The particle board category is an aggregate category. **It includes** oriented strandboard (OSB), waferboard and flax-board. **It excludes** wood wool and other particle boards bonded together with inorganic binders. **It is reported in** cubic metres solid volume.

6.3.1 ***ORIENTED STRANDBOARD (OSB)***

A structural board in which layers of narrow wafers are layered alternately at right angles in order to give the board greater elastomechanical properties. The wafers, which resemble small pieces of veneer, are coated with e.g. waterproof phenolic resin glue, interleaved together in mats and then bonded together under heat and pressure. The resulting product is a solid, uniform building panel having high strength and water resistance. **It excludes** waferboard. **It is reported in** cubic metres solid volume.

6.4 ***FIBREBOARD***

A panel manufactured from fibres of wood or other ligno-cellulosic materials with the primary bond deriving from the felting of the fibres and their inherent adhesive properties (although bonding materials and/or additives may be added in the manufacturing process). **It includes** fibreboard panels that are flat-pressed and moulded fibreboard products. **In JQ1 and JQ2, it is an aggregate comprising** hardboard, medium density fibreboard (MDF) and other fibreboard. **It is reported in** cubic metres solid volume.

6.4.1 ***HARDBOARD***

Wet-process fibreboard of a density exceeding 0.8 g/cm^3 . **It excludes** similar products made from pieces of wood, wood flour or other ligno-cellulosic material where additional binders are required to make the panel; and panels made of gypsum or other mineral material. **It is reported in** cubic metres solid volume.

6.4.2 MEDIUM DENSITY FIBREBOARD (MDF)

Dry-process fibreboard. When density exceeds 0.8 g/cm^3 , it may also be referred to as “high-density fibreboard”(HDF). **It is reported in** cubic metres solid volume.

6.4.3 OTHER FIBREBOARD

Wet-process fibreboard of a density not exceeding 0.8 g/cm^3 . This includes mediumboard and softboard (also known as insulating board). **It is reported in** cubic metres solid volume.

7 WOOD PULP

Fibrous material prepared from pulpwood, wood chips, particles or residues by mechanical and/or chemical process for further manufacture into paper, paperboard, fibreboard or other cellulose products. **In JQ1 and JQ2, it is an aggregate comprising** mechanical wood pulp; semi-chemical wood pulp; chemical wood pulp; and dissolving wood pulp. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content).

7.1 MECHANICAL WOOD PULP

Wood pulp obtained by grinding or milling pulpwood or residues into fibres, or through refining chips or particles. Also called groundwood pulp and refiner pulp, it may be bleached or unbleached. **It includes** chemi-mechanical and thermo-mechanical pulp. **It excludes** exploded and defibrillated pulp. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content).

7.2 SEMI-CHEMICAL WOOD PULP

Wood pulp obtained by subjecting pulpwood, wood chips, particles or residues to a series of mechanical and chemical treatments, none of which alone is sufficient to make the fibres separate readily. It may be bleached or unbleached. **It includes** chemi-groundwood pulp, chemi-mechanical wood pulp, etc. (named in the order and importance of the treatment during the manufacturing process). **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content).

7.3 CHEMICAL WOOD PULP

Wood pulp obtained by subjecting pulpwood, wood chips, particles or residues to a series of chemical treatments. **It includes** sulphate (kraft) wood pulp; soda wood pulp and sulphite wood pulp. It may be bleached, semi-bleached or unbleached. **It excludes** dissolving grades of wood pulp. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content). If available, statistics for

the following four component pulps are also requested: unbleached sulphite pulp; bleached sulphite pulp; unbleached sulphate pulp; and bleached sulphate pulp.

7.3.1 *SULPHATE UNBLEACHED PULP*

7.3.2 *SULPHATE BLEACHED PULP*

Wood pulp obtained by mechanically reducing pulpwood, wood chips, particles or residues to small pieces that are subsequently cooked in a pressure vessel in the presence of sodium hydroxide cooking liquor (soda pulp) or a mixture of sodium hydroxide and sodium sulphite cooking liquor (sulphate pulp). **It excludes** dissolving grades of wood pulp. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content). Data for two classes (bleached, including semi-bleached, and unbleached) are requested separately.

7.3.3 *SULPHITE UNBLEACHED PULP*

7.3.4 *SULPHITE BLEACHED PULP*

Wood pulp obtained by mechanically reducing pulpwood, wood chips, particles or residues to small pieces that are subsequently cooked in a pressure vessel in the presence of a bisulphite cooking liquor. Bisulphites such as ammonium, calcium, magnesium and sodium are commonly used in this process. **It excludes** dissolving grades of wood pulp. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content). Data for two classes (bleached, including semi-bleached, and unbleached) are requested separately.

7.4 *DISSOLVING GRADES*

Chemical pulp (sulphate, soda or sulphite) made from wood of special quality, with a very high alpha-cellulose content (usually 90% and over). This type of pulp is always bleached and is readily adaptable for uses other than papermaking. It is used principally as a source of cellulose in the manufacture of products such as synthetic fibres, cellulose plastic materials, lacquers and explosives. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content).

8 *OTHER PULP*

Pulp manufactured from waste paper or from fibrous vegetable materials other than wood and used for the manufacture of paper, paperboard and fibreboard. **In JQ1 and JQ2, it is an aggregate comprising** pulp from fibres other than wood and recovered fibre pulp. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content).

8.1 *PULP FROM FIBRES OTHER THAN WOOD*

Pulp manufactured from fibrous vegetable materials other than wood and used for the manufacture of paper, paperboard and fibreboard. **It excludes** pulp made from recovered paper. **It includes** pulps made from: straw; bamboo; bagasse; esparto; other reeds or grasses; cotton fibres; flax; hemp; rags; and other textile

wastes. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content).

8.2 RECOVERED FIBRE PULP

Pulp manufactured from recovered paper or paperboard and used for the manufacture of paper, paperboard and fibreboard. **It excludes** pulp made from straw; bamboo; bagasse; esparto; other reeds or grasses; cotton fibres; flax; hemp; rags; and other textile wastes. **It is reported in** metric tonnes air-dry weight (i.e. with 10% moisture content).

9 RECOVERED PAPER

Waste and scraps of paper or paperboard that have been collected for re-use as a raw material for the manufacture of paper and paperboard. **It includes** paper and paperboard that has been used for its original purpose and residues from paper and paperboard production. **It is reported in** metric tonnes.

10 PAPER AND PAPERBOARD

The paper and paperboard category is an aggregate category. **In the production and trade statistics, it represents the sum of** graphic papers; sanitary and household papers; packaging materials and other paper and paperboard. **It excludes** manufactured paper products such as boxes, cartons, books and magazines, etc. **It is reported in** metric tonnes.

10.1 GRAPHIC PAPERS

The graphic papers category is an aggregate category. **In the production and trade statistics, it represents the sum of** newsprint; uncoated mechanical; uncoated woodfree and coated papers. Products in this category are generally manufactured in strips or rolls of a width exceeding 15 cm or in rectangular sheets with one side exceeding 36 cm and the other exceeding 15 cm in the unfolded state. **It excludes** manufactured paper products such as books and magazines, etc. **It is reported in** metric tonnes.

10.1.1 NEWSPRINT

Paper mainly used for printing newspapers. It is made largely from mechanical pulp and/or recovered paper, with or without a small amount of filler. Products in this category are generally manufactured in strips or rolls of a width exceeding 36 cm or in rectangular sheets with one side exceeding 36 cm and the other exceeding 15 cm in the unfolded state. Weights usually range from 40 to 52 g/m² but can be as high as 65 g/m². Newsprint is machine finished or slightly calendered, white or slightly coloured and is used in reels for letterpress, offset or flexo printing. **It is reported in** metric tonnes.

10.1.2 UNCOATED MECHANICAL

Paper suitable for printing or other graphic purposes where less than 90% of the fibre furnish consists of chemical pulp fibres. This grade is also known as groundwood or wood-containing paper and magazine paper, such as heavily filled supercalendered paper for consumer magazines printed by the rotogravure and offset methods. **It excludes** wallpaper base. **It is reported in** metric tonnes.

10.1.3 UNCOATED WOODFREE

Paper suitable for printing or other graphic purposes, where at least 90% of the fibre furnish consists of chemical pulp fibres. Uncoated woodfree paper can be made from a variety of furnishes, with variable levels of mineral filler and a range of finishing processes such as sizing, calendering, machine glazing and watermarking. This grade includes most office papers, such as business forms, copier, computer, stationery and book papers. Pigmented and size press "coated" papers (coating less than 5 g per side) are covered by this heading. **It excludes** wallpaper base. **It is reported in** metric tonnes.

10.1.4 COATED PAPERS

All paper suitable for printing or other graphic purposes and coated on one or both sides with carbon or minerals such as china clay (kaolin), calcium carbonate, etc. Coating may be by a variety of methods, both on-machine and off-machine, and may be supplemented by supercalendering. **It includes** raw carbon and self-copy paper in rolls or sheets. **It excludes** other copying and transfer papers. **It is reported in** metric tonnes.

10.2 SANITARY AND HOUSEHOLD PAPERS

This covers the stock of a wide range of tissue and other hygienic papers for use in households or commercial and industrial premises. Products in this category are generally manufactured in strips or rolls of a width exceeding 36 cm or in rectangular sheets with one side exceeding 36 cm and the other exceeding 15 cm in the unfolded state. Examples are toilet paper and facial tissues, kitchen towels, hand towels and industrial wipes. Some tissue is also used in the manufacture of baby napkins, sanitary towels, etc.

The parent reel stock is made from virgin pulp or recovered fibre or mixtures of these. **It is reported in** metric tonnes.

10.3 PACKAGING MATERIALS

Paper or paperboard mainly used for wrapping and packaging purposes. Products in this category are generally manufactured in strips or rolls of a width exceeding 36 cm or in rectangular sheets with one side exceeding 36 cm and the other exceeding 15 cm in the unfolded state. **It excludes** unbleached kraft paper and paperboard that are not sack kraft paper or Kraftliner and weighing more

than 150 g/m² but less than 225 g/m²; felt paper and paperboard; tracing papers; not further processed uncoated paper weighing 225 g/m² or more. **It is reported in metric tonnes.**

10.3.1 CASE MATERIALS

Papers and boards mainly used in the manufacture of corrugated board. They are made from any combination of virgin and recovered fibres and can be bleached, unbleached or mottled. **It includes** kraftliner, testliner, semi-chemical fluting, and waste-based fluting (*Wellenstoff*). **It is reported in metric tonnes.**

10.3.2 CARTONBOARD

Sometimes referred to as folding boxboard, it may be single- or multi-ply, coated or uncoated. It is made from virgin and/or recovered fibres, and has good folding properties, stiffness and scoring ability. It is mainly used in cartons for consumer products such as frozen food and for liquid containers. **It includes** paper and paperboard covered or coated with plastics (excluding adhesives) and coated multi-ply. **It is reported in metric tonnes.**

10.3.3 WRAPPING PAPERS

Wrappings (up to 150 g/m²): Papers whose main use is wrapping or packaging made from any combination of virgin or recovered fibres, bleached or unbleached. They may be subject to various finishing and/or marking processes. **It includes** sack kraft, other wrapping krafts, sulphite and greaseproof papers as well as coated paper and paperboard not uniformly bleached throughout the mass, except multi-ply. **It excludes:** tracing papers. **It is reported in metric tonnes.**

10.3.4 OTHER PAPERS MAINLY FOR PACKAGING

This category embraces all papers and boards mainly for packaging purposes other than those listed above. Most are produced from recovered fibres, e.g. greyboards, and go for conversion, which in some cases may be for end-uses other than packaging. **It is reported in metric tonnes.**

10.4 OTHER PAPER AND PAPERBOARD N.E.S. (NOT ELSEWHERE SPECIFIED)

Other papers and boards for industrial and special purposes. **It includes** cigarette papers and stock of filter papers, as well as gypsum liners and special papers for insulating, roofing, and other specific applications or treatments; wallpaper base; unbleached kraft paper and paperboard that are not sack kraft paper or Kraftliner and weighing more than 150 g/m² but less than 225 g/m²; felt paper and paperboard; tracing papers; not further processed uncoated paper weighing 225 g/m² or more; and raw copying and transfer papers, in rolls or sheets except carbon or self-copy paper. **It excludes** all composite, not coated, paper and paper board of flat layers stuck together; coated paper and

paperboard not uniformly bleached throughout the mass; and paper and paperboard covered or coated with plastics (excluding adhesives). **It is reported in metric tonnes.**

STANDARD CONVERSION FACTORS

A. Imperial – Metric Conversions

Imperial Unit	Metric Equivalent
1 inch	= 25.4 millimetres
1 square foot	= 0.0929 square metre
1 cubic foot	= 0.02832 cubic metre
1 short ton	= 0.9072 metric ton
1 long ton	= 1.016 metric ton

B. Forest Products Measures

JQ Code	Product and Unit	Cubic Metres	Cubic Feet	1000 Board Feet	Standard (Petrograd)
1	ROUNDWOOD				
	1 hoppus cubic foot	0.03605	1.273		
	1 ton of 5 hoppus cubic feet	1.8027	63.66		
	1 cunit	2.83	100		
	1 cord ¹	3.625	128		
	1 stere ¹	1	35.315		
5	SAWNWOOD				
	1 standard (Petrograd)	4.672	165	1.98	1
	1 000 board/super feet	2.36	83.33	1	0.505
	1 ton of 50 cubic feet	1.416	50	0.6	0.303
6	WOOD-BASED PANELS				
	1 000 square metres (1 millimetre thickness)	1	35.315	0.4238	
	1 000 square feet (1/8 inch thickness)	0.295	10.417	0.125	

¹ Stacked volume

C. Approximate Roundwood Factors

JQ Code	Product and Unit	Cubic Metres	Cubic Feet
		Solid volume without bark	
1.2.1	SAWLOGS AND VENEER LOGS		
	1 000 board/super feet	4.53	160
1.2.2	PULPWOOD (ROUND & SPLIT)		
	1 stere	0.72	25.4
	1 cord	2.55	90
1.1	WOOD FUEL, INCLUDING WOOD FOR CHARCOAL		
	1 stere	0.65	23
	1 cord	2.12	74.9
	1 000 stacked cubic feet	18.41	650

D. Approximate Weight and Volume Factors

JQ Code	Product	Kg/CUM			CUM/MT		
		G	C	NC	G	C	NC
1.1	WOOD FUEL, INCLUDING WOOD FOR CHARCOAL	725	625	750	1.38	1.60	1.33
2	WOOD CHARCOAL	167					
1.2.1	SAWLOGS AND VENEER LOGS						
1.2 NC.T	Tropical			730			1.37
1.2.1.C &.NC	Other		700	800		1.43	1.25
1.2.2	PULPWOOD (ROUND & SPLIT)	675	650	750	1.48	1.54	1.33
1.2.3	OTHER INDUSTRIAL ROUNDWOOD	750	700	800	1.33	1.43	1.25
5	SAWNWOOD		550	700		1.82	1.43
6.1	VENEER SHEETS	750			1.33		
6.2	PLYWOOD	650			1.54		
6.3	PARTICLE BOARD, OSB, and OTHER	650			1.54		
6.4.1	HARDBOARD	950			1.053		
6.4.2	MDF (MEDIUM DENSITY FIBREBOARD)				2		
6.4.3	OTHER FIBREBOARD	250			4		

Note: G = general; C = coniferous; NC = non-coniferous

The factors in tables C and D will vary between and within countries. Please use national factors where possible and indicate these in your response.

Components of wood product groups

(Based on Joint Forest Questionnaire nomenclature)

The important breakthrough of the major groups of primarily forest products are diagrammed below. In addition, many sub-items are further divided into soft-wood or hardwood. These are all the roundwood products, sawnwood, veneer sheets and plywood. Items that do not fit into listed aggregates are not shown. These are wood charcoal, chips and particales, wood residues, sawnwood, other pulp and recovered paper.

