Developments of Wood Markets – Resizing of Timber Industry

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Abstract

The forecasts for the next decades point out new centers of economic development far away from current ones, which will confirm the changed balance of today's situation. The unprecedented demographic growth in Asia and the aging of the European and North American population will also result in the occurrence of controversial scenarios for the whole region in terms of economic evolution. China became the world leader also for wood products and furniture manufacturing, respectively in raw material import. Wood markets and trade worldwide are changing rapidly because of the booming production capacities of the last decades, dramatic reduction of North American consumption, the new energy policy based on wood biomass, the increased demand of wood as raw materials especially in Asia and Central Europe and, of course, the continuing current economic crisis. The new development related to energy production from wood biomass hardly starts to compete with the raw material market for European and soon the North American wood based panel producers. High productivity may be obtained by means of new wood working technologies with low raw material input and reduced power consumption. The new requirements for low emission panel products increased the competition between the European producers. Also the top 10 of the world and European wood based panels producers start to close their aging capacity and reduce production figures. The last of which consists of more than half of the panel production capacity and control a fifth of world production. Also the environmental issues continue to differ from one country to another and even within different regions in the same country and involve different levels of investment and production costs having an immediate impact on market competitiveness.

Key words: forest figures, wood markets, wood based panel developments

1. SOCIAL AND ECONOMIC SITUATION

Population distribution and its welfare still contrast strongly from one country to another. In 2011 according to UNO the world population is already 7 bill., mainly concentrated in Asia (60%), as follows: 20% in China (1.34 bill.), 17% in India (1.19 bill.), 3.4% in Indonesia (238 mill.), 2.5% in Pakistan and Bangladesh each (170 mill.), 14% on the African continent (2.3% in Nigeria) only 11% in Europe (731 mill.), 8% in North America (514 mill.) and 5% in South America (371 mill.). The actual projection is 8 bill. by 2025. The population of the world in 1960 was about 3 bill.

According to UNO statistics the population growth forecast for the following four decades is further in favour of the Asian, African and South American continents. The population of the North American continent will slowly continue to grow by designed emigration; the European population will dramatically diminish if no immediate emigration policy is provided by the Commission. In the next 40 years, according to the best case scenario of UN the African population could increase twofold (1.9 bill.), and India, with 1.6 bill., will surpass China (1,4 bill.). In addition to the fact that the populations of the today's advanced countries will significantly decrease and will grow old. In accordance with the present moderate forecasts, the world population will reach 9 bill. inhabitants before the year 2050.

The world gross product (WGP) according IMF was about 78,950 bill. USD in 2011. It is to be pointed out that USA and European Union, with less than 20% of the world population, contribute more than 50% of WGP. Also contrasting is the fact that Africa and the Indian Peninsula contribute only 4% of WGP, although possessing considerable natural riches and having about 40% of the world population. The hierarchy of the industrialized countries is now substantially modified by the fast growing countries (e.g. China, Brazil, India, Mexico) ranking among the top 10 with respect to gross national product.

2. FOREST AND LOG PROCESSING

About 31% of the land area of the world is covered by forests, which means 4 bill. ha, out of which more than two thirds belong to underdeveloped or developing countries. Of the world’s total forested area 20% belongs to Russia, 17.5 % to North America (half by Canada), 13% to Brazil and less than 4% to EU27.

Inside the EU27, the main area covered by forest represents 41% (177.8 mill. ha). Only 132.6 mill. ha (75%) are suitable for roundwood production. The main area of forest for the wood supply is owned by Sweden and Finland (each 15%), followed by France and Spain (each 11%), Germany (with 8%), and Poland and Italy 6% each). The forest ratio per capita of EU27 is 0.35 ha but Scandinavian countries are the leaders: Finland 4.5 ha, Sweden 3.5 ha compared to Spain 0.6 ha/ and France 0.3 ha.

The growing stock of the world in 2010 was above 500 bill. m³, from which Brazil accounts for one quarter, followed by Russia and North America (each 16%) while the EU27 has less than 5%. The growing stock of EU27 is approximated at 21.75 bill. m³ at an yearly increment of 768 mill. m³. Between countries, Germany has 3.47 bill. m³ (16%), Sweden 2.65 bill. m³ (12%), France 2.45 bill. m³ (11%), Poland and Finland over 2 bill. m³ (each 9%).

The roundwood density (over bark) are reaching the maximum in Brazil (243 m³/ha),

followed by USA and EU27 (each about 160 m³/ha), Canada and Russia (each above 100 m³/ha) compared to China and India with only 80 and 70 m³/ha. respectively. Inside the EU27 Austria, Slovenia and Germany have the highest roundwood density in their forest (approx. 330 m³/ha) followed by Slovakia, Belgium and Poland (over 245 m³/ha) and Romania, Estonia and Lithuania (over 200 m³/ha each). France and Italy have approx. 160 m³/ha each and Sweden only 129 m³/ha.

The share of coniferous growing stock in the world is two thirds (same like in EU27) compared to three quarters in North America and Russia.

The annual average removal of roundwood in the world in 2009 was 3.28 bill. m³ (of which 57% as fuel) shared by the EU27 (12%), USA and India (each 10%), China and Brazil (each 9%), Russia (5%) and Canada and Indonesia (above 3%). The difference between these world top 10 countries is the way to use the removed roundwood: processing over 90% in North America, over 80% for EU27, over 70% for Russia and less than 50% for Brazil vs. less than 10% in India and China. The production of roundwood in the EU reached an all-time high in 2007, peaking at 458 million m³ - also because of additional removals attributable to the large number of trees damaged in storms. Industrial roundwood production fell by more than 10 % after 2008 and this trend continues. Within the EU27 the annual removal of 391 mill. m³ roundwood (20% for fuel) are made by Sweden (17%), Germany and France (each 14%), Finland (11%), Poland (9%).

The world annual average removal for fuelwood for the same year was 1,85 bill. m³ used especially as a major source of energy in many developing countries, who consumed around three quarters of the world's fuelwood. The share of fuelwood in removals was considerably higher in Africa (89%) and Asia (77%), falling to 24% in Europe. By continents, Asia (41%) and Africa (33%) are burning three quarters of world wooden fuel. In contrast, Europe produced 8% and North America only 7% of the world's fuel (2009). A high proportion of global fuelwood is from broad-leaved species (89%). By country India (17%), China (11%), Brazil (8%), and the EU27 (less than 5%) are the main fuel producers. The EU27 is using 82.6 mill. m³ roundwood as fuel. The main wooden fuel producers in Europe are France (31%), Germany (10%) and Sweden, Finland and Italy (each 6%) [FAO, Eurostat 2011].

3. WOOD PROCESSING INDUSTRY

In 2008 the EU27 wood-based manufacturing industry had a turn-over of more than 413 bill. €, employing 2.77 mill. people in 328,300 companies. The wood and wood-products industries employ 1.16 mill. people, the same figure as the furniture industry (1.2 mill.) vs. 0.7 mill. in the paper and paper products industry. In terms of turnover, the paper and products industry makes 180 bill. € (high productivity due to high automatisation), wood and wood products 131.5 bill. € and the furniture industry 115 bill. € (due to more hand labour). Between countries China ranks on top with 1.25 mill. persons (more than EU 27), followed by USA 536,000, Russia 340,000, Indonesia 300,000, Brazil 225,000, Italy 155,000, Poland and Germany (each over 135,000) [FAO, Eurostat 2011].

3.1 Sawn wood

The world production of sawnwood was 362 mill. m³ in 2009 (10% less than in 1999). More than one quarter is processed in the EU27, equal to that of North America (1/3 Canda and 2/3 USA, where actually only 2/3 of the 1999 level was processed), followed by China (9%),

Brazil (7%) and Russia (3%). The continent with the lowest sawn production is Africa and Oceania (each above 2%). In 2007 the EU production of sawnwood peaked with over 115 mill. m³. By 2009 this figure dropped by over 22%. The main share of sawnwood within EU27 (91 mill. m³) in 2009 was held by Germany (23%), Sweden (18%), Austria, Finland and France (each 9%) [FAO, Eurostat 2011].

3.2. Wood based panels

The production lines manufacturing wood based panels have developed more and more, reaching high production capacities (>1.500 m³/day per line). The trend of building new production capacities stopped completely at least within North America and Central Europe after the start of the crises in 2008. Big panel producers of the world are tailoring their own available capacities. Many closures of old or small plants were recorded especially in the USA and the EU27. The prediction, one decade ago, that only a few large industrial groups would operate in the world, concentrating an overwhelming proportion of the wooden based panels capacity, has been further "supported" by the financial crises. Small- and medium-sized producers not involved in this process will only be able to survive by specializing in the manufacture of types and sizes of boards that are "unprofitable" for mega-groups [Barbu, 2009].

The total installed capacity worldwide for wood based composite panels has risen from 2000 to 2010 by more than 25%, reaching 235 mill. m³/year. The increase in capacity of the most recent years was only in South-East Asia and South America. In Europe new production capacities are only being developed in the East, particularly in Russia and Turkey.

Europe and China each hold more than 30% of the world capacity for wood based panels. The production of wood-based panels (comprising particleboard, fibreboard, plywood and veneers) reached 70 mill. m³ in 2007. By 2009 European production retracted by 20%.The main panel producer in Europe is Germany (26%). Turkey increased its capacities at a high rate reaching 2nd place after Germany. Russia will become an important player in this industry with operating capacities of close to 8 mill. m³ at the moment. The main market share in Europe belongs to Austrian group owners Kaindl (Krono Group) and Egger (28%, respectively 12%) and the top 4 of them (including Sonae and Pfleiderer) controll more than half of the European capacity. The top 10 of Europe is producing up to 75% [WbPI, EUWID 2011].

The availability and quality of raw materials determines the type and concentration of the panel industry in Europe. The South is specialized in particleboard, the Alps and central region in softwood mills, pulp & paper and also MDF industry, and in Scandinavia only sawnwood, pulp (58% of total), paper and veneer based products are produced. The huge urban areas provide recycled wood which in the past was only used only for particleboard now also has to be shared with biomass energy producers.

Among the various types of wood-based panels manufactured within the EU, over 60% of production was for particleboard (37.6 mill. m³ in 2009). The EU production of particleboard (PB) was more than twice the level of the output recorded for fibreboard (15 mill.m³), such as hardboard (HB), medium-density fibreboard (MDF) and softboard (SB, also known as insulating board). The level of production in the EU27 of plywood (PY) and of veneer sheets was at 3 mill. m³ and 1.4 million m³ respectively. The largest overall contraction between

2006 and 2009 was recorded for HB (-53%), while the production of PY fell by 35%. The smallest reduction in output was recorded for oriented strand boards (OSB), with an overall decline of less than 6% [Eurostat 2011].

3.2.1. Particleboard (PB)

Particleboard kept its significant market share for decades with its popularity worldwide (above 40%) and in Europe (60%, incl. Russia and Turkey), loses constantly the ground in North America and Central Europe as well. The world production capacity for 2010 was above 96 mill. m³. An unexpected invigoration of production capacities can be seen lately in Eastern Europe by 3 mill. m³ (incl. Russia and Turkey), Latin America by 1 mill. m³. Europe incl. Russia and Turkey still holds the first position worldwide concerning production capacity (54 mill. m³). The main producers of the world by their installed capacities are Germany (8.4 mill. m³), USA and China (est. by less than 8 mill.m³ each), Russia (est. by less than 6.5 mill.m³), Turkey (over 5 mill. m³), Brazil, France and Italy (over 4.3 mill. m³ each), and Spain and Thailand (over 3.2 mill. m³) [WbPI, 2011]. The demand for PB is maintained constant due to the cheap raw materials originated in the recycled wood (harsh competition to biomass based energy generation) and low price compared to MDF (50%). The increased use of recycled material became state of the art and factories fit their equipment for the preparation of this type of raw material. One aspect that could be improved is still the on-line detection of contaminants in recycled material. The main use of PB in Europe is for the furniture industry (54%) because of the existing processing technology, and its light weight and low price compared to other panels. A slight loss in flooring and building share is noticed because of MDF, specifically OSB. A new generation of light particleboards with a density of less than 500 kg/m³ is established. New regulations for free formaldehyde emission of PB (Perforator 4 mg/100g) were implemented since 2009 [Barbu, 2009; EPF, 2011].

3.2.2. Plywood (PY)

Plywood holds the second position (74 mill. m³) worldwide after PB. However, it is less and less mentioned by statistics, due to the severe lack of appropriate raw material, and high labour costs especially in developed countries. Because of this situation there are no significant European capacities for the plywood production (3.5 mill. m³ in 70 small companies). The newly developed MDF and OSB boards tend to substitute it, offering economic benefits in furniture manufacture and construction. Over the last two decades, there has been an increase in plywood production worldwide (+50%). China is now the biggest plywood manufacturer of the world (over 35 mill. m³). Asia without China already surpassed North America (17 mill. m³), with a positive tendency with regards to the evolution of capacities. In South America (over 4 mill. m³), Brazil, is one of the worldwide main plywood exporter. In North America, Central Europe and Oceania, a constant decrease in the production capacities can be noted. Eastern Europe and Russia are other regions with a positive evolution in this respect. In Europe, the processed plywood represents 15% of the world production capacity and is covered by two thirds from imports (China, Brazil, Russia, all above 75%) [Barbu 2011; EPF 2011].

3.2.3. Oriented strand board (OSB)

Oriented strand board seems to be like MDF in its evolution and had a growth of more than 40% in the same decade. In North America, where OSB launched as a building material to the detriment of plywood and PB, 85% of the global production capacity (30 mill. m³) was

concentrated. In the last decade in Europe the annual production capacity has doubled, reaching 5 mill. m³. Related to world capacity (=North America) it represents less than 15%. More than 30% of the EU27 production (3 mill. m³) is exported to Eastern regions. New lines are realised for the very first time in Russia and China. The world forecast for the next years depends strongly on the development of the collapsed building industry in North America. The unprecedented evolution of the installed capacities for OSB production in North America began to decline since the recent crises. The total production capacity of North America in 2010 was 24 mill. m³ but the producers reduced their out-put due to the low request from market. Only 60 to 70% of this capacity was operating in the last years. Some of the temporarily closed mills got bankrupt and merged into other groups. Most of the planed new projects in USA and Canada (over 2 mill. m³) are cancelled or delayed [Barbu, 2009]. Further investments are forecasted for the 1st time in Turkey, Ukraine, and Venezuela. The main use of OSB is for construction (75%) and packaging. VOC of pine strands and increasing requirements for indoor air quality are new optimization fields. The new emission values for formaldehyde were issued by middle of 2009 [EPF, WbPI 2011].

3.2.4 .Medium density fibreboard (MDF)

Over the last 5 years, the medium density production capacity has seen the quickest increasing rate, surprisingly in China (over 10 mill. m³) and its neighbouring regions (1.5 mill. m³), as well as in South America (5 mill. m³), Russia (over 1 mill. m³), Turkey (about 1 mill. m³), not in Central Europe or North America where the initial boom took place. MDF – after 45 years of manufacture, is produced on more than 500 production lines, with a production capacity (over 80 mill. m³) distribution as follows: 46% in China, less than 25% in Europe (incl. Russia and Turkey), and the rest shared between Asian countries (11%, without China), Latin America (9%) and North America (7%). In the same period in North America (-20% in USA), Oceania, and parts of Asia the production activity was stopped and lines have been closed down, dismounted and relocated. For the last five years only one MDF new project was completed in Central Europe while China doubled its installed capacity. New lines are planed only in South America (1.5 mill. m³), China (1 mill. m³), South-Eastern Asia (1 mill. m³), Russia and Turkey (about 1 mill. m³ each) [WbPI, 2011]. The main use of MDF is for furniture (55%) as substrate panels. One third of MDF is produced as thin HDF and coated for flooring. A light overcapacity and price instability have driven manufacturers to keep their production constant or to reduce it. Because the furniture sales suddenly decreased due to the instable financial situation and low number of new buildings in USA and Eastern Europe production figures decreased too. From 2008 on new regulations require a limit of 5 mg/100 g (Perforator) for free formaldehyde emission. A reduction of weight for thicker boards is still greatly demanded by customers [EPF, EUWID 2011].

3.2.5. Fibre based insulation boards in dry process

The fibre based insulation boards market in Europe, particularly in Germany, is presently in a renaissance. In recent years, the European market of insulating materials represented 30 mil. m²/year. Different European manufacturers of conventional wood based panels have also been producing wood-fibre-insulating-boards since the middle of the nineties in different new dry-processes beside the revised wet-process. Wood fibre insulating materials with thicknesses over 200 mm and densities below 50 kg/m³ can be produced for the first time on an industrial scale without gluing multiple thin fibreboards. The manufacture of very low density fibreboards in the dry process requires an activation of the resin over convective media such as hot-air, superheated steam or a mixture of both, and an adaptation of the

pressing technique. These new light fibreboards clearly have better physical characteristics (thermal conductivity) compared to classical products like fibreboards made using the wet process (>150 kg/m³). The physical properties of light wood fibreboard for insulation are not inferior for example to mineral wool. Insulation products made of regenerative raw materials are about twice as expensive as classical insulation products and have only been able to be partly established on a large market [Barbu, 2011].

3.2.6. Hardboard (HB) and softboards (SB) in wet process

Hardboard (HB), manufactured by the wet process, is the board with the longest tradition, after plywood and blockboard. At least in Europe (both type less than 5%), hardboard production is obviously in decline, not due to the board properties (NB: board with very low emissions), but due to environmental problems, especially water treatment owing to the ecological nature of the material and particularly to the performances similar to those insulating materials. On the other hand the softboards (SB < 400 kg/m³) production rose in the same period.

3.2.7. Other wood based composites

The production of wood pellets in North America and the EU grew at a phenomenal rate. Between 2008 and 2009 (7.8 mill. t) it raised about 40 %. More than half of the EU's production was concentrated within Germany (1.5 mill.t) and Sweden (2.0 mill.t) and Latvia (670,000 t), Poland and France (each over 550,000 t), Estonia (close to 500,000 t). An unprecedented development is also evident in Russia which owns the 1st pellets mill with 1 mill. t production capacity in one site [Eurostat, Euwid 2011].

Parquet (not HDF based flooring) had a positive and constant evolution for more than two decades. Nowadays, 100 mill. m² of parquet were produced in Europe. The main manufacturers are Sweden (22%), Poland (12%), Germany (12%) and Spain (10%). The main producer groups are located in Scandinavia but production also takes place in other European and Asian countries. The parquet consumption is 0.23 m² per inhabitant, on average. However, the greatest parquet-consumer countries are Germany (22%), Spain (18%), Italy (15%) and France (11%). The most widespread type of parquet is laminated (80%) due to its reasonable price, high performance, and easy assembly. Although the price of massive parquet and the labour costs are high, the consumed volume remains steady (15%) [HZB, EUWID 2011].

3.3. Furniture

The furniture industry witnesses worldwide profound changes in terms of both the manufacturers and the diversity of products, which need to meet the new requirements of the customers. The traditional furniture manufacturers in the Central Europe and North America are hardly facing up to the competition of the new manufacturers from countries under development in Eastern Europe and South-East Asia which, little by little, are beating them on quantity and the price level. Additionally IKEA and other similar low budget furniture trading chains have greatly influenced the developments of last decades.

The competition of sale prices has become all around the world one of the crucial factor in the marketing of furniture. The need for personalized furniture and satisfying the personal tastes is ever more important in the designing of furniture. The modernization of the furniture

manufacturing processes by the aid of completely controlled production flows and centres, automatically and instantaneously adjustable according to the series to be processed, creates competition in this market. The forecast predicting the migration of the production centres from Western and Central Europe to the East of the continent has not been accepted for a long time. Today, the ultra-conservative investors have to face it as an obvious and painful reality.

5 years ago furniture production reached the value of 200 bill. €. The forecasts for the year 2000 considered that the furniture production in Europe and North America would continue growing – but, unfortunately, this scenario did not come true. Since 2000 until the present, China has managed to double its furniture production and to increase exports threefold; so that Chinese-made furniture represents 25% of the total quantity produced by the USA and EC together. This discrepancy results from production costs, which are 70-80% lower in China than in North America or Central Europe. The huge amount of furniture imports in USA determined a clear downward trend for their domestic production and the relocation of the manufacturing centres outside.

The same tendency is seen in the European market, too. China has become one of the biggest furniture suppliers, after Germany, Italy and Poland. In Germany for instance, an obvious decline in the number of small plants manufacturing custom-made furniture has been recorded over the last decade, in contrast to an unexpected increase in the number of assembling facilities for imported pre-manufactured furniture (threefold). In general the Chinese furniture market, demanding over two thirds of the domestic production, cannot be overlooked.

The furniture consumption in the Europe and North America is not stabilized. This undesirable evolution can be accounted for by the negative demographic development in the industrialized countries, the rise in the cost of living, the increase of the unemployment rate in some regions, and especially the development of a new category of furniture, the so called “do it yourself” (Ikea), with low prices and an acceptable service life and the current fast moving world financial crises [Barbu, 2009]. Pöyry forecasts an increase of the world demand from 12 to 14.7 mill. m² for coating materials by 2015. Especially the melamine based paper coatings will reach 45% market share. This expected development has to follow the booming development in the emerging countries, the apparition of conurbations and new environmental aspects.

3.4. Construction

For the first time for many decades, and because of the unexpected rise in the price of steel, modern wooden construction can compete with the classical systems made of concrete and steel especially. The new wooden structures are favoured by the elements in their structure based on Glue Laminated Timber (GLT), I-beams, OSB faced frames and Cross Laminated Timber (CLT), developed with pre-designed high properties and meeting the same requirements as the rest of the building materials: fireproofness, large spans, multi-floors, low weights at high dimensional stability in various environments and, last but not least, easy and fast assembly are the characteristics of the new generation of wooden constructions.

The tradition and impact of prefabricated houses in Europe is still low. Aspects like energy saving, low costs and fast manufacturing time need to be better explained and spread for a large acceptance and successfully marketing. New European regulations like the Energy

Saving Certificate for houses and new regulation for building with more than seven floors in urban areas could sustain positive developments. The renovation of existing buildings especially the thermal insulation is an activity over a large time span.

3.5 Recovered wood, recycled pulp and paper and fuel wood for biomass energy

3.5.1 Recovered wood [Eurostat, 2011]

Waste treatment operations distinguish between five different treatment types: recovery, energy recovery, incineration, disposal on land, and land treatment/release into water. Almost 25 mill. t of wood waste were treated in the EU (2008), while the figure for paper and cardboard was 13.3 mill. t higher. The highest share of wood waste in the EU (2008) was generated by wood manufacturers (39%). Households accounted for the highest share of waste paper and cardboard (30%). Both wood manufacturing and paper manufacturing accounted for only a small share of the total waste generated by all activities. Looking in more detail at the recycling of wooden packaging some 5.1 mill. t and 25.2 mill. t of paper and cardboard packaging were recycled in the EU (2008). The production of recovered pulp fibre and recovered paper in the EU was 23 mill. t and 50 mill. t respectively (2009). Germany alone accounted for more than half (56%) of the recovered fibre pulp and the addition of Spain and the UK led to a cumulative share of 88%. The main production of recovered paper was in Germany (30%). Together with the UK, France, Italy and Spain accounted for 75% of the EU total. The two largest producers of recovered fibre pulp in the world are China and the EU.

3.5.2 Biomass energy generation from wood (waste) [Eurostat, 2011]

Within the EU, energy from biomass has become increasingly important in recent years, as policymakers seek to ensure diverse and secure energy supplies while at the same time considering the impact of energy policy on climate change. The introduction within the EU of national targets for 2020 concerning the share of renewable energy in gross inland energy consumption, will likely have a significant impact (not only positively) on the forest sector (negatively for panels, pulp and paper production), given that wood and wood waste is currently the largest source of renewable energy. Indeed, the use of biomass from both forests and agriculture is forecast to increase sharply in the coming decades.

Wood for use as an energy source (a fuel) comes not only from tree felling, but also from selective thinning of managed forests and other forestry practices (direct sources). Wood for energy use may also be derived as a by-product from downstream processing in wood-based manufacturing (indirect sources). End-of-life wood and paper products may also be used as a source of energy (recovered wood). Information collected shows that direct sources of total wood used as an energy source in France was 84% which contrasts to the high share of indirect sources in Sweden (81%) and Finland (78%). The share of recovered wood rose in Germany (23%) and UK (29%), which reflects the new landfill legislation that encourages wood waste to be used or traded, as well as the promotion of biomass energy production. Private households were the main users of wood as a source of energy (48%) of the wood used for energy purposes (2007).

Renewable energy sources accounted for only 8% of the EU's gross inland consumption of energy (2008). This share was only 4% in 1990. EU gross inland energy consumption of wood and wood waste was 71 mill. t oil equivalents (2008). Wood and wood waste was the

leading renewable energy resource in the EU, accounting for 47% of all gross inland energy consumption from renewable energy sources and for 68% of the total for biomass and waste (remainder 14% municipal solid waste, 11% biofuels and 7% biogas).

Aside from its conversion into heat through combustion, biomass energy sources may also be transferred into electricity, gas, or liquid fuel. Biomass is increasingly used in complex installations (i.e. the production of combined heat and power or co-combustion technologies for power generation). Net electricity generation from biomass-fired power stations in EU accounted only 3% (2008).

4. SUMMARY

The world roundwood production was the same in the last decade. 8% reduction in the world's industrial roundwood production was recorded for the same time period in the favor of fuelwood. Asia accounted for the highest share (30%) of the world's roundwood production (2009), which still didn't cover its own need.

The world's sawnwood production was 7% lower than a decade before. Europe accounted for more than 35%) of global output in 2009, while production in China and India doubled in the last decade (from relatively low levels). The producers will be constrained to reduce the transportation expenses especially for raw materials, to sell wood and processing wastes directly to biomass energy producers and to take organizational actions destined for making the manufacturing process more flexible. An interesting example is that of briquetting of chips resulted from the wood primary processing (pellets), as well as that of the bark and other process residues conversion in order to efficiently produce heat energy and electric power on site. The overcapacity of sawmills installed in the last years, especially in German speaking region and neighboured countries will be severely reduced by bankrupts and merging.

Northern and Central America produced 40% of the world's wood pulp (1,5 times more than in 1999). The relative contributions of Brazil and China doubled to 8 % and 4% of the world's wood pulp by 2009. Global paper and paperboard production in 2009 was 20% higher than in 1999. Over the last decade, Asia has the position of global leader (42%) as result of China overtaking the USA [Eurostat, 2011].

In the last decade China has become the top producer for wood based-panels producing 36% of the world volume in 2009 (6 times increase) and the forecast will continue to be a positive one. The installed overcapacity for wood based panels and the ongoing financial crises with its dramatic impact on building and furniture sales forced manufactures to reduce their production rate and sales prices to the level of production costs and close systematically the old lines. The reduction of board weight and emissions on the one hand and the increase in use of recycled wood on the other hand is an important goal but not the solution to protect some of the companies against shutting down their activities. A further harsh concentration of the existing capacities in some international acting megagroups could be the short term forecast.

Furniture made from low weight elements (sandwich type or foamcore) and low emission panels especially for the "do it yourself" segment is a probable direction of developments in the near future. Other processing and finishing technologies adapted to the new quality of board (light weight and low emissions) should be extended in the market and accepted by

processing companies.

The different regulations in the EU states subventions of green energy generated from biomass (= approx. same raw materials like for PB) and in environmental protection (waste air, waste water and noise) create precedents for unequal competition inside Europe and between the industries. Some regions also offered important subventions or taxes reductions in order to settle down industrial production sites which also creates different advantages compared to other producers

The forecast for the coming years will continue to be a negative one for North America and Central Europe, stating a consolidation of the available new production capacities and closing of the lines with different accents depending on the effect of the financial crisis on the furniture and building industry from one continent and region to the other.

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