Slovak Market Report 2018

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Ministry of Agriculture and Rural Development of the Slovak Republic
National Forest Centre – Forest Research Institute Zvolen
Zvolen, October 2018

1. General economic trends affecting the forest and forest industries sector (brief description)

Basic national and sectoral macro-economic indicators, including the overview of most important forest sector indicators in 2017 are given in Tables 1-1 and 1-2. The growth of the Slovak economy continued also in 2017. The value of Gross Domestic Product (GDP) rose at current prices by 3.4% to €84.99 billion. The main reason for GDP growth was foreign demand, and personal consumption was also risen, particularly in the services sector. Sectoral GDP constituted 0.30% of national GDP.

Growth of investment at a national level by 10.3% was influenced especially by the growth of the Slovak economy and drawing on funds EU. Investments into forest estate and production operations totalled €40 million, representing a 34.4% decrease from the previous year. At a national level, the percentage of sectoral investment cut down from 0.37 to 0.22% of national investment. The sectoral workforce grew by 2.2% as compared to 2016. Average monthly earnings of employees in economy of the SR increased year-on-year by 4.6% while in forest sector by 2.8%.

1-1 Trends of selected indicators in forestry and its comparison with Slovak national economy

Indicator	Unit	Year				
		2010	2013	2015	2016	2017
GDP in current prices	billion €	67.58	74.17	78.69	80.96	84.99
Of that: Forest Sector		0.22	0.28	0.28	0.27	0.30
Increment of GDP	%	5.6	2.0	3.3	2.9	3.4
Investment in current prices	mil. €	14 910	15 374	18 108	16 332	18 018
Of that: Forest Sector		32	24	39	61	40
Employment	thous. persons	2 170	2 192	2 267	2 321	2 372
Of that: Forest Sector		9	10	10	10	11,2
Average monthly salary	€	769	824	883	912	954
Of that: Forest Sector		676	907	996	1 004	1 032
Value-added labor productivity		27 543	29 958	29 099	31 423	32 304
Of that: Forest Sector		19 693	29 797	34 953	33 783	37 666

2. Policy measures taken in your country over the past 18 months

Act No. 113/2018 on the placing of timber and timber products on the internal market; this Act entered into force on 1 July 2018.

The purpose of the Act is to prevent the entry of timber from illegal logging or a products of such timber into the internal market through the responsible government authorities, the definition of their competencies and the determination of sanctions for administrative offenses in this area. The Act appoints that the central state authority in the field of timber marketing on the domestic market in Slovakia will be the Ministry of Agriculture and Rural Development.

The Act also covers the EU Timber Regulation (3 March 2013) that prohibits operators in Europe from placing illegally harvested timber and products derived from illegal timber on the EU market. It establishes licensing system for imports of timber and detailed rules for the implementation of EU Timber regulation. In the forests designated for the defense of the state, the Ministry of Defense will be the supervising authority.

The newly established Slovak Forestry and Wood Inspection will supervise for suppliers and processors of timber, traders and transporters. It will be authorized to impose measures, decide on offenses and other administrative violations, perform free of charge advice on timber marketing within the internal market and on due diligence systems, cooperate with the authorities in the provision and control of public funds, other public authorities, police forces; to provide co-operation to customs authorities and other public authorities in case of doubts about the type, quantity and origin of timber and timber products.

Decree of the Ministry of Agriculture and Rural Development of the Slovak Republic No. 226/2017 on providing support for fulfilment of non-productive forest functions; entered into force on 1 October 2017.

Support is provided to the support beneficiary who is a forest manager if he meets the following conditions: a) cleaning and thinning operations performed in forests stands aged up to 50 years (in accordance with valid forest management plan) and/or the removal of invasive tree species; b) forest regeneration applied within the close to nature management through a small-scale shelterwood silvicultural system, selection or special purpose cutting, resulting in multi-storey forest stands.

Regular annual evaluation of fulfilment of Action plans both National forest programme (NFP) and National programme of utilization of wood potential (NPUWP) in the Slovak Republic worked out for the period 2014-2020. Evaluation is carried out by Ministry of Agriculture and Rural Development through National Forest Centre.

3. Market drivers

Slovakia is an open economy and its development depends on demand in foreign markets, especially the EU markets. This fact was the reason also for economic growth in 2017. Development of the Slovak economy in 2018 will depend on the development of demand in the markets of major trading partners. These factors will also affect the area of wood production and processing in Slovakia. In the next period, a similar growth rate of the economy is expected to continue as in the past year, which should also ensure a favourable macroeconomic environment for forest sector in the SR.

This relatively favourable environment should be utilized for realization of relevant goals and measures above mentioned action plans for implementation of NPUWP as well as NFP. In particular to implement measures to increase the competitiveness of the wood processing sector, focusing mainly on the development of higher added value sectors and those where there is a negative trade balance, such as the production of veneers (mainly non-coniferous), the production of fibreboard and OSB boards, components for wooden houses, secondary paper products, and recycled paper processing.

In order to achieve a higher quality and degree of finalization of wood processing, it is also necessary to provide support for investment in production technologies also from public sources. Investment in technologies will contribute to higher added value production and higher wood finishing in domestic conditions, but also to increase labour productivity and competitiveness.

Therefore, it is also necessary to encourage the domestic processing of raw wood and sawnwood; to reduce timber exports, in particular by increasing the capacities of the domestic wood processing industry, in particular in the field of high quality wood processing and improving the consumer-supply relations. It is necessary to encourage the arrival of an investor into the processing capacity of the higher quality hardwood (non-coniferous sawnwood).

4. DEVELOPMENTS IN FOREST PRODUCTS MARKETS SECTORS

a. Wood raw materials

Timber supply

In 2017, the total supply of raw timber reached a volume of 9.36 million m^3, an increase of 1% compared to 2016. Timber sale is the most important source of earnings to preserve forest functions and maintain employment in the forest sector. It provides approximately 80% of the revenue and earnings for forest managing enterprises. In addition to the forest sector, timber is also a basic raw material for the timber processing industry (TPI), thus securing employment, earnings and revenue also in this sector of the national economy.

Table 4a.1 Log grade structure of raw timber supply

Grade	2017 (m^3)				Year (%)	
	Slovakia	Export	Own con-sumption	Total	2016	2017
Softwood						
I grade logs	1,74	0,02	4,97	**6,73**	0,09	0,12
II grade logs	6,53	0,16	0,00	**6,68**	0,04	0,12
III grade logs	2 885,05	40,98	37,96	**2 964,00**	57,24	53,71
Paper-pulp & abrasive timber	0,49	0,00	0,00	**0,49**	0,02	0,01
Mining timber	16,02	0,06	0,01	**16,08**	0,19	0,29
Thin poles	19,40	0,00	0,11	**19,50**	0,29	0,35
Pulpwood	1 554,64	34,83	4,34	**1 593,81**	27,50	28,88
Energy wood	124,14	0,00	6,59	**130,73**	4,27	2,37
Fuelwood	179,16	0,27	7,66	**187,08**	0,56	3,39
Stumpage	382,11	10,46	0,44	**393,01**	3,77	7,12
Raw trunks	198,86	1,19	0,14	**200,19**	6,03	3,63
Total	5 368,12	87,97	62,21	**5 518,30**	100	100
Hardwood						
I grade logs	2,80	2,65	0,00	**5,45**	0,11	0,14
II grade logs	15,34	8,06	0,00	**23,39**	0,51	0,61
III grade logs	1 325,27	82,65	1,58	**1 409,49**	34,63	36,68
Mining timber	7,98	0,17	0,00	**8,15**	0,03	0,21
Thin poles	2,02	0,00	0,14	**2,16**	0,12	0,06
Pulpwood	1 879,39	158,63	2,37	**2 040,39**	56,19	53,09
Energy wood	46,63	0,00	11,30	**57,93**	1,56	1,51
Fuelwood	210,54	1,09	3,73	**215,37**	4,92	5,60
Stumpage	57,21	0,17	0,35	**57,73**	1,22	1,50
Raw trunks	22,95	0,00	0,19	**23,14**	0,71	0,60
Total	3 570,13	253,41	19,66	**3 843,19**	100	100
∑softwood & hardwood	8 938,25	341,38	81,86	**9 361,49**	--	--
Softwood lumber	46,20	0,17	0,24	**46,60**	95,62	98,80
Hardwood lumber	0,31	0,25	0,01	**0,57**	4,38	1,20
Chipwood (tonnes)	67,54	0,00	0,63	**68,17**	--	--

Domestic timber supply

In 2017, domestic timber supply totalled 9.02 million m^3 (including timber used by forest enterprises themselves). Compared to 2016, the supply of timber to the domestic market was

higher by 152,600 m^3. Supplies of softwood increased by 331,100 m^3. At the same time, supplies of hardwood decreased by 178,500 m^3.

In supplies of softwood log grades, 53.7% of the total volume were III grade logs and 28.9% was pulpwood. Hardwood supplies has long been dominated by pulpwood which accounted for 53.1% of the total volume in 2017. More detailed data on timber supply to the domestic market are given in Table 4a.1 and Figures 4a.1 and 4a.2.

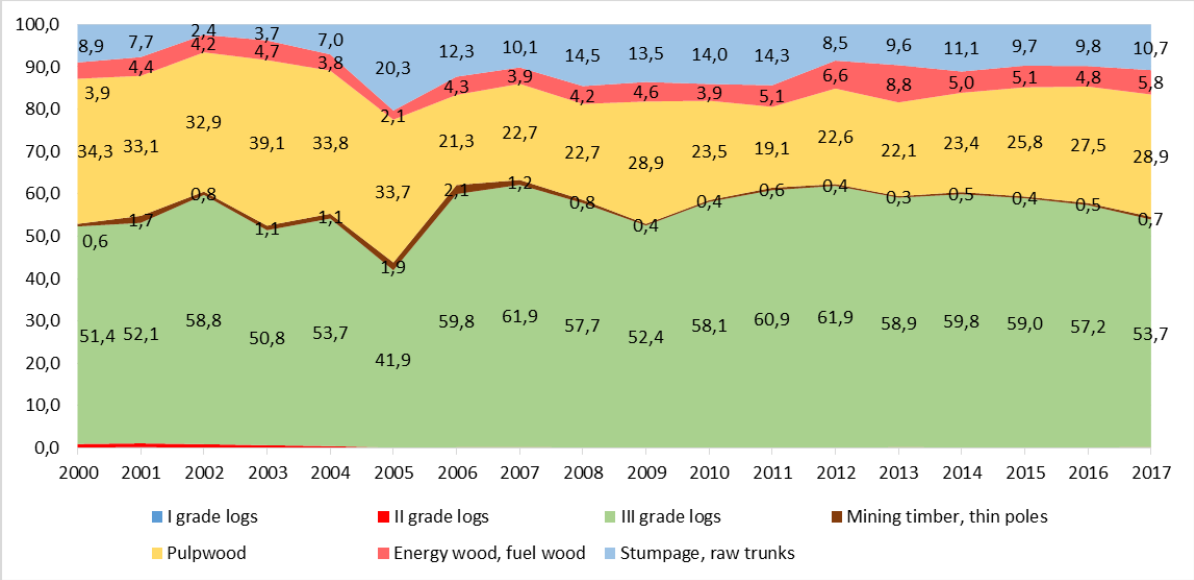


Figure 4a.1 Development of softwood supplies by the grade of assortment (%)

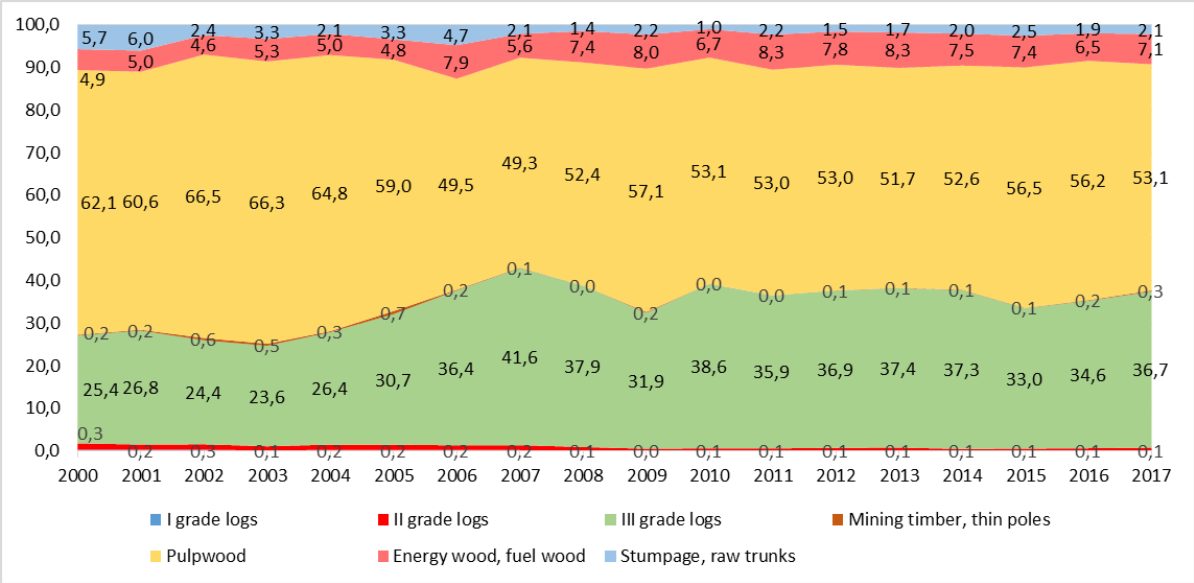


Figure 4a.2 Development of hardwood supplies by the grade of assortment (%)

Foreign timber trade

Preliminary data on foreign trade statistics show that 2.02 million m^3 of raw timber was exported in 2017 (4a.3). This figure represented the lowest export volume in the last 10 years. Forest enterprises exported 341,400 m^3, or 16.9% of the total export volume. The remaining 83.1% were exported by various non-forestry entities, commercial companies in particular. Timber was mainly supplied to the EU countries. Of the exported softwood and hardwood log grades, I-III log grades were most represented.

In 2017, 927,000 m^3 of raw timber were imported to Slovakia, which was 351,000 m^3, or 60.9% more than in 2016 (4a.4). The positive fact is that this increase was mainly attributed to an increased volume of I-III log grades of softwood and hardwood being imported.

In trading of raw timber log grades we can observe a positive trend of reducing the volume of exported timber whilst increasing the volume of imported higher quality log grades.

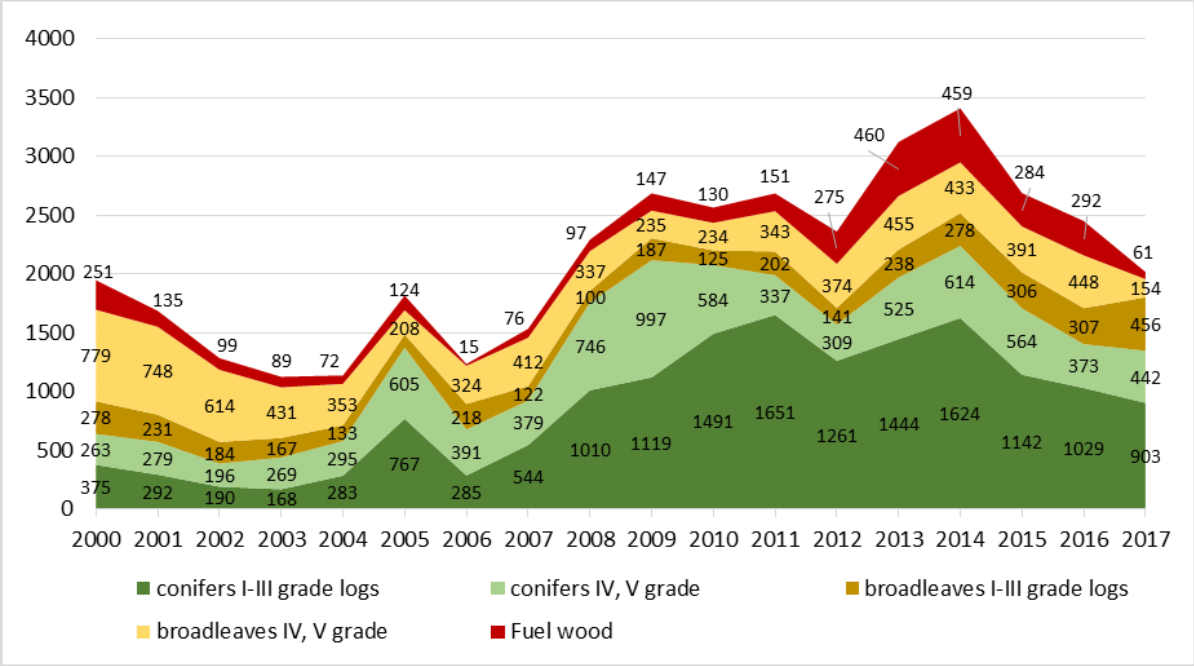


Figure 4a.3 Development of timber export, thousand m^3

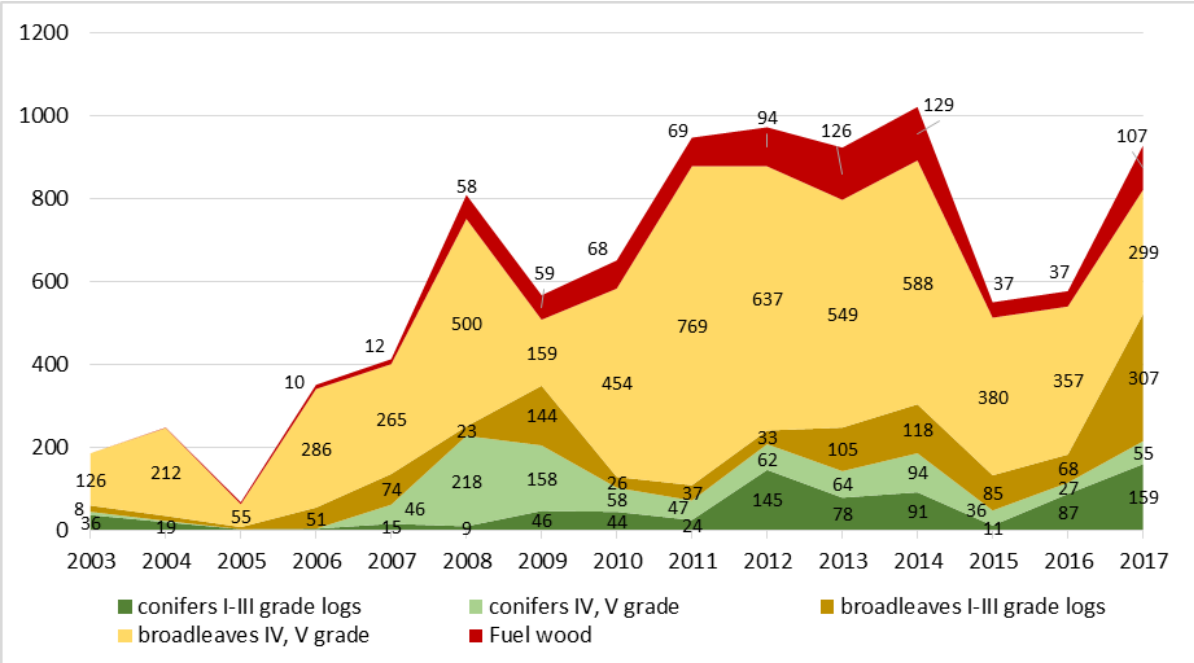


Figure 4a.4 Development of timber import, thousand m^3

Timber prices on domestic and foreign markets

In 2017, earnings from timber trading in softwood log grades were down on 2016 by € 1.66/m^3, or 3.3%. Conversely, hardwood log grades were on average selling for € 2.69/m^3, or 6.1%, more than in 2016. Average earnings from traded raw timber grades has remained largely unchanged

since 2011, with a slight increase in the prices of hardwood log grades and a decrease in the prices of softwood log grades.

Export prices of softwood log grades have fallen sharply from € 68.5/m^3 to € 48.2/m^3 which is an almost 30% drop since 2013. Conversely, hardwood prices after a sharp drop from € 80.4/m^3 to € 52.2/ m^3 in 2008 started to slowly recover to the current level of € 57.6/m^3. (Figures 4a.5-4a.7).

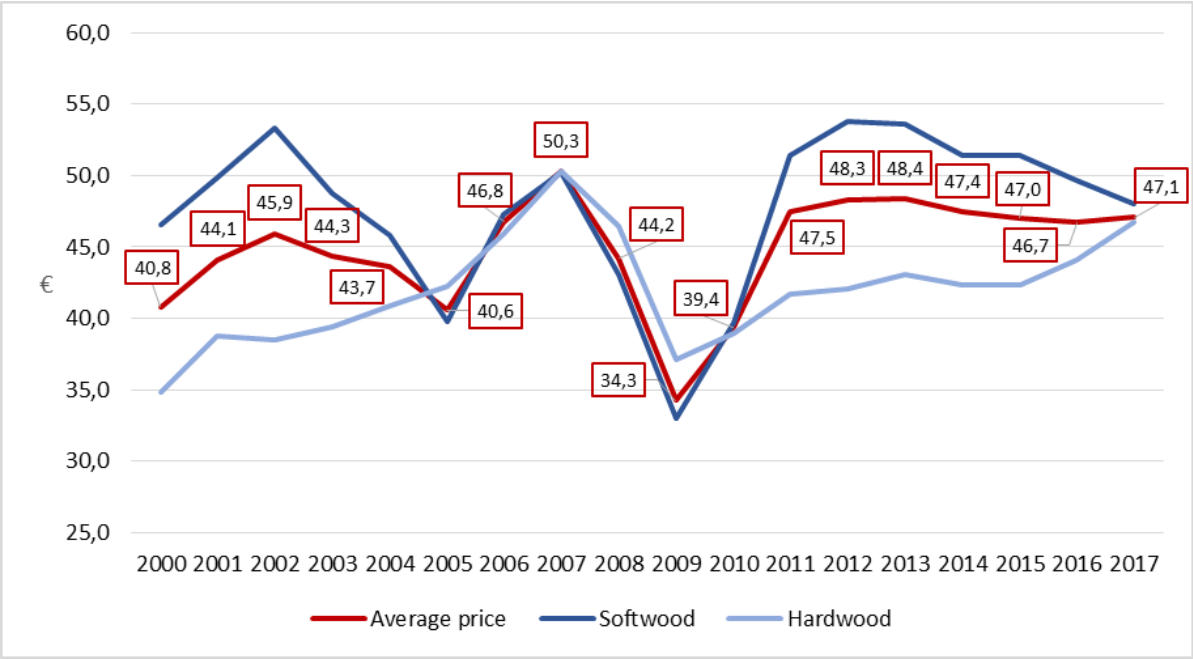
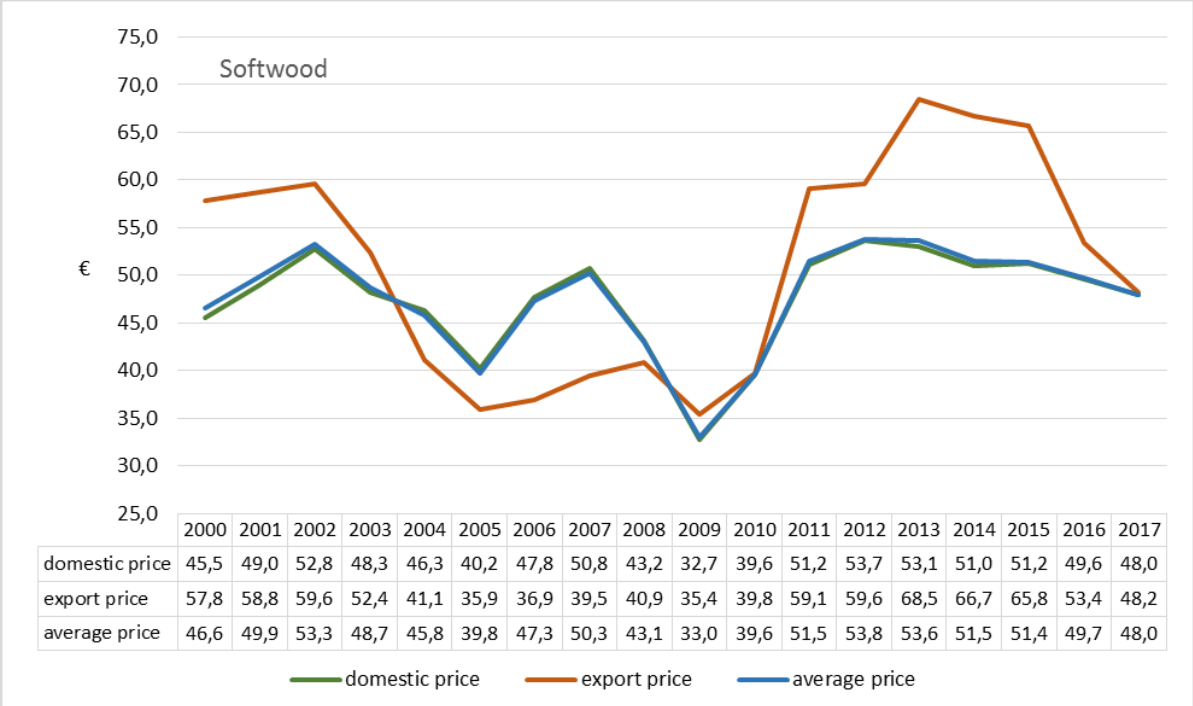
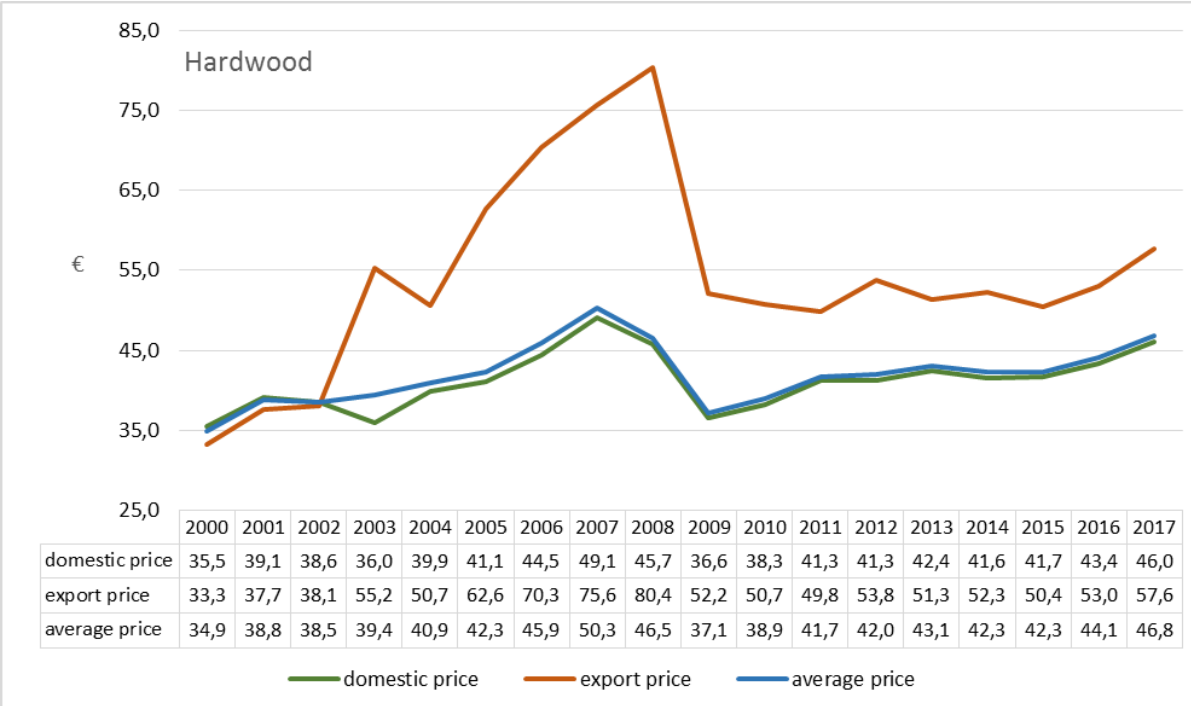


Figure 4a.5 Development of average earnings from timber trading in forestry of the SR



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
domestic price	45,5	49,0	52,8	48,3	46,3	40,2	47,8	50,8	43,2	32,7	39,6	51,2	53,7	53,1	51,0	51,2	49,6	48,0
export price	57,8	58,8	59,6	52,4	41,1	35,9	36,9	39,5	40,9	35,4	39,8	59,1	59,6	68,5	66,7	65,8	53,4	48,2
average price	46,6	49,9	53,3	48,7	45,8	39,8	47,3	50,3	43,1	33,0	39,6	51,5	53,8	53,6	51,5	51,4	49,7	48,0

Figure 4a.6 Development of softwood grades prices in forestry of the SR



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
domestic price	35,5	39,1	38,6	36,0	39,9	41,1	44,5	49,1	45,7	36,6	38,3	41,3	41,3	42,4	41,6	41,7	43,4	46,0
export price	33,3	37,7	38,1	55,2	50,7	62,6	70,3	75,6	80,4	52,2	50,7	49,8	53,8	51,3	52,3	50,4	53,0	57,6
average price	34,9	38,8	38,5	39,4	40,9	42,3	45,9	50,3	46,5	37,1	38,9	41,7	42,0	43,1	42,3	42,3	44,1	46,8

Figure 4a.7 Development of hardwood grades prices in forestry of the SR

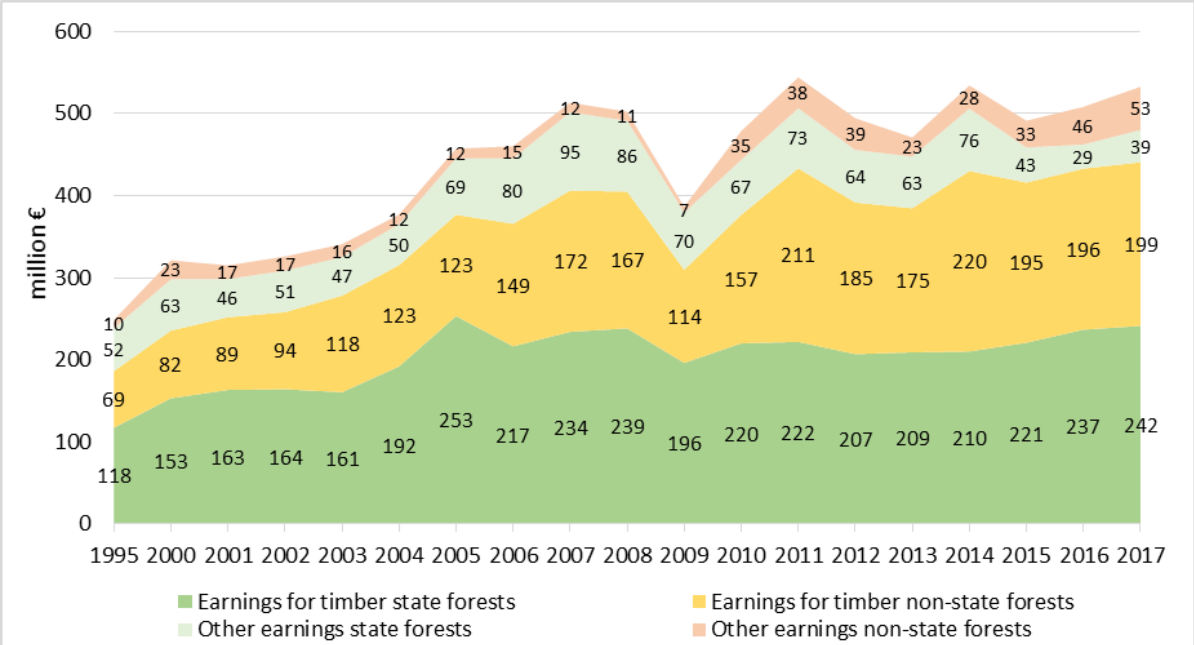


Figure 4a.8 Development of earnings for timber and other earnings and revenues in forestry

b. Wood energy, with a focus on government policies promoting wood energy

In 2017, the total consumption of solid fuelwood biomass (fuelwood, wood chips, woody residue, briquettes and pellets) reached 3.05 million tonnes. The key consumers of woody fuels, the dominant renewable source of energy in Slovakia, are the timber processing, pulp and papermaking industries, private households, municipal heat units and the energy sector.

The share of combined generation of electricity and heat in the overall energy production from woody fuels increased slightly. Compared to 2016, the total production increased by 100,000 tonnes. There was a change in the overall consumption structure in favour of the timber processing industry, due to the increase in the volume of industrial wood processing by

domestic processing companies (export decrease, import increase). The share of woody fuels in the total consumption of primary energy sources in the Slovak Republic was 1.9%.

Due to the change in the structure of woody fuel consumption in favour of the timber processing industry which uses its own woody residue as well as the decline in the felling of broadleaved species, the supply of fuelwood biomass from forest enterprises fell down by to 15,000 tonnes to 1.42 million tonnes when compared to 2016. Annual fuelwood consumption increased by 15,000 tonnes and reached 845,000 tonnes. The growth was attributed to the increase in the number of family houses partially or exclusively heated by fuelwood. Consumption of wood chips decreased by 30,000 tonnes to 580,000 tonnes. The decrease was chiefly associated with stagnation in consumption in municipal heat units and energy sector, abundant supply of wood chips from non-forest sources, and higher costs for the production and transport of wood chips from forests. Fuelwood biomass accounted for 46.7% of the total annual consumption of woody fuels.

Table 4b.1 Woody biomass for energy production

Year	Chips[1)]		Fuelwood and others [2)]		Total	
	1000 tonnes	TJ	1000 tonnes	TJ	1000 tonnes	TJ
2017	580	5 510	845	8 028	1 425	13 538
2016	610	5 795	830	7 885	1 440	13 680
2015	615	5 843	835	7 933	1 450	13 776
2013	620	5 890	820	7 790	1 440	13 680
2010	250	2 375	695	6 602	945	8 977
2005	120	1 140	640	6 080	760	7 220
2000	5	48	471	4 475	476	4 523
1990	2	19	368	3 496	370	3 515

Note: [1)] Chips and woody biomass for the production of chips; [2)]Fuelwood and wood used for energy from woody residue, felling debris and dead trees.

c. Certified forest products

Under the both PEFC and FSC schemes, 1.379 million ha of forests, or 70.9% of the total forest area in Slovakia, were certified at 31 December 2017; of that under PEFC scheme it was 1.232 million ha. To date, 273 certificates have been issued on participation in forest certification under the PEFC and FSC schemes; of that 263 under PEFC. The PEFC Slovakia had 20 members at 31 December 2017 in three chambers: Forest Owner (Lessee) Chamber, Chamber of Timber Processors and the Chamber of Other Stakeholders.

In 2017 under PEFC, 14 timber processors and business associates successfully passed the Chain of Custody (C-o-C) audit of forest products, bringing the number of valid C-o-C certificates to 80 and the number of certified C-o-C companies to 86. According to the 2016 FSC data, a total of 32 forest managing enterprises are certified (including two state enterprises) and 123 C-o-C certificates have been issued to date.

d. Timber processing industry

The total volume of timber processed in Slovakia grew from 7,394,000 m^3 to 8,272,000 m^3, or 11.8%. Year-on-year consumption of softwood and hardwood logs of I-III grades, softwood logs of IV-V grades and fuelwood all increased. On the other hand, consumption of hardwood logs of IV-V grades continued to stagnate.

Table 4d.1 Production, import, export and consumption of raw timber in 2016

Log grade	Production	Import	Export	Consumption
Conifer I – III log grades	3 570,60	159,42	902,85	2 827,17
Conifer IV – V log grades	1 629,88	54,96	442,34	1 242,51
Broadleaved I – III log grades	1 519,20	306,65	456,06	1 369,79
Broadleaved IV – V log grades	2 050,69	298,53	154,04	2 195,18
Fuelwood	591,11	107,13	60,34	637,89
Total	9 361,49	926,68	2 015,62	8 272,55

Source: Quaterly Timber Supply Record Les D (MARD SR) 2-04; Statistical Office of the SR – unconfirmed 2015 data; Prepared by: NFC.

The growth in domestic timber processing was reflected in maintaining the industry's economic results at the 2016 level and a creation of 961 jobs which represented a growth of 4.3% (Table 4d.2).

Despite the positive development of economic indicators and growth in the volume of domestic timber processing, there has been no significant increase in the competitiveness of most enterprises of mechanical wood processing and the growth of added value. Production mostly consists of sub-deliveries of unfinished products with a lower level of finalisation for foreign companies. Only a small part of top quality roundwood is being processed, with domestic production at around 300,000 m^3. Except for few multinational companies operating in Slovakia, no significant investments in the modernisation of processing technologies have been made.

On the other hand, the pulp and papermaking sectors belong to the best performing industries of the national economy and 11 companies associated in the Pulp and Paper Industry Federation of the Slovak Republic cover most of the production in the entire industry. The industry is forced to respond to changes in demand on the European market, in particular through innovation and changes in the structure of production.

Table 4d.2 Selected economic indicators

Indicator	Industry	Million €					
		2010	2012	2014	2015	2016	2017*)
Revenue	TI	456	494	613	590	687	673
	FI	621	661	771	817	964	923
	PPI	1 458	1 407	1 317	1 379	1 372	1 388
	Total	2 535	2 562	2 701	2 786	3 023	2 984
Costs	TI	469	513	597	573	660	655
	FI	607	665	805	835	950	894
	PPI	1 328	1 315	1 222	1 242	1 220	1 253
	Total	2 404	2 493	2 624	2 650	2 830	2 802
Gross economic result	TI	- 13	- 19	16	17	27	18
	FI	14	- 4	-34	-18	14	29
	PPI	130	92	95	137	152	135
	Total	131	69	77	136	193	182
Employment	TI	5 667	5 031	5 005	4 875	4 954	5 400
	FI	10 236	9 806	10 583	11 102	11 287	11 426
	PPI	6 591	6 202	5 986	6 110	6 205	6 581
	Total	22 494	21 039	21 573	22 087	22 446	23 407

Source: Ministry of Economy of the SR 2006-2011; SO SR 2012 -2015 (Record Prod 3-04).
Key: TI - Timber industry, FI – Furniture-making industry; PPI - Pulp and papermaking industry.

From the analyses of a preliminary data of the customs statistics for 2017 results that the current trade balance of the forest industry reached the surplus for the year 2017, amounting to 879.67

mil. €. The trade surplus in exports of following products: wood raw assortments 85.18 mil. €, export of sawn-wood 111.48 mil. € as well as export of recovered paper 27,04 mil. € is unfavourable from the viewpoint of the trade with wood products.

Similarly, negative trade balance in the production of veneer of 17.4 mil. € (imported is mainly non-coniferous veneer) and secondary products made of paper in the amount of 10.69 mil. € (imported are cartons and packaging paper and specially prepared papers).

On the other hand trade surplus for products with high added value, such as the production of panels of 40.66 mil. € (Slovakia exports plywood and particleboard and imports OSB boards and fibre boards), pulp and paper production 155.39 mil. € and secondary wood products amounting to 455.08 mil. € (we mainly export joinery products, furniture and other wood products) is very positive phenomenon.

On the basis of the above mentioned trade balance, the modernization of technics and technology with the aim of increasing the efficiency of production should be the main priority of the development of the forestry sector and thus also increasing the competitiveness of wood-processing plants.

It is necessary to support the development of sectors that are able to provide higher added value, in particular those where there is a negative trade balance, such as the production of veneers (mainly non-coniferous), the production of fibreboard and OSB boards, the manufacture of secondary paper products and the processing of recycled paper.

An important environmental aspect of timber production and its use is the fact that timber used for products, particularly long-life ones, protects the atmosphere from CO2 for decades. Therefore, it is important and desirable to use timber as much as possible for a wide range of different products with the longest possible lifetime. Carbon stored in wood is released back into the atmosphere only when the products turn to waste or fuel. In 2016, 3.11 million tonnes of CO2 was estimated to be stored in wood-based products in Slovakia. At the same time, 2.051 million tonnes of CO2 was released into atmosphere from wood products used up in 2016. The overall balance is thus highly positive since the volume of CO2 bound in wood products increased by 1.059 million tonnes. Figure 4d-1 shows the final balance of CO2 sinks and emissions within all basic categories of wood products (conifer and broadleaved sawnwood, wood panels, paper and cardboard) since 1990.

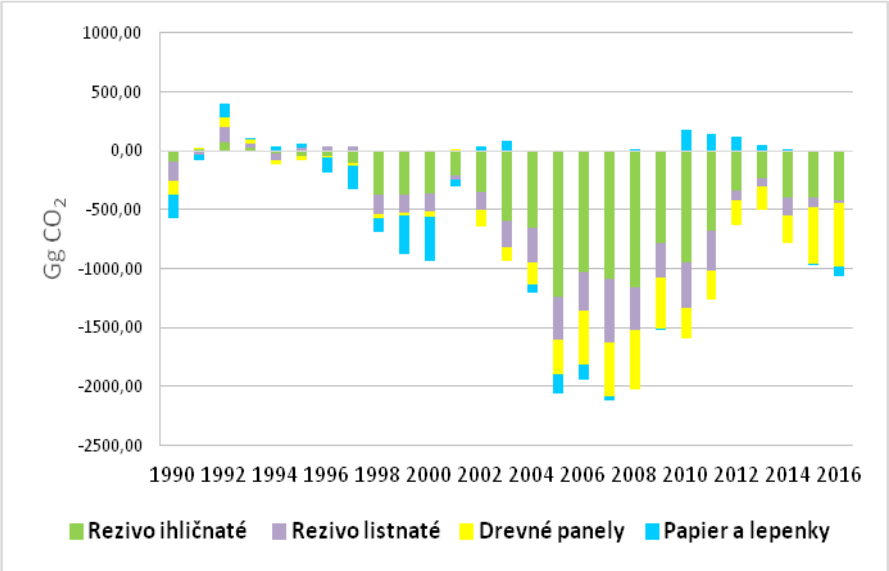


Figure 4d.1 The resulting balance of "CO_2 sinks" and "CO_2 emissions" (in Gg CO_2 eq.) in the basic categories of wood products

Explanatory notes:

"Sinks" means CO_2 stored in wood products which release into the atmosphere with a delay and have negative values in the balance; "Emissions" means the volumes of CO_2 released into the atmosphere from consumed wood products, in the positive value balance.
Sawn softwood (rezivo ihličnaté); Sawn hardwood (rezivo listnaté); Wood panels (drevné panely) Paper and paperboard (papier a lepenky)

e. Sawn softwood

	SAWNWOOD, CONIFEROUS		2016	2017	2018 estimate	2019 forecast
5.C	Production	1000 m^3	3 488	3571	3 575	3 580
	Imports		87	159	145	130
	Exports		1 029	903	860	810
	Apparent consumption		2 546	2 827	2 860	2 900

The highest volumes of coniferous sawnwood were imported from the Russian Federation and the Ukraine. Exports were mainly directed to EU.

f. Sawn hardwood

	SAWNWOOD, NON-CONIFEROUS		2016	2017	2018 estimate	2019 forecast
5.NC	Production	1000 m^3	380	432	450	475
	Imports		30	30	30	30
	Exports		179	141	150	150
	Apparent consumption		232	321	330	355

Import and export of sawnwood realizes mainly in EU markets.

g. Wood-based panels (particle board, fibreboard and MDF, OSB, plywood)

- Veneer sheets

	VENEER SHEETS		2016	2017	2018 estimate	2019 forecast
7	Production	1000 m^3	17	18	19	20
	Imports		17	19	22	25
	Exports		10	11	13	15
	Apparent consumption		24	26	28	30

- Plywood

	PLYWOOD		2016	2017	2018 estimate	2019 forecast
8.1	Production	1000 m^3	420	483	490	500
	Imports		65	70	70	75
	Exports		116	130	130	135
	Apparent consumption		370	423	430	440

- Particle board

	PARTICLE BOARD		2016	2017	2018 estimate	2019 forecast
8.2	Production	1000 m^3	595	633	640	650
	Imports		318	228	230	240
	Exports		518	606	600	600
	Apparent consumption		395	255	270	290

Slovakia does not have capacity for the production of MDF.

- Fibreboard

	FIBREBOARD		2016	2017	2018 estimate	2019 forecast
8.3	Production	1000 m^3	0	0	0	0
	Imports		218	248	250	250
	Exports		30	37	35	35
	Apparent consumption		188	211	215	215

h) Pulp and paper

	WOOD PULP		2016	2017	2018 estimate	2019 forecast
9	Production	1000 m^3	699	728	735	740
	Imports		158	153	155	155
	Exports		220	253	250	250
	Apparent consumption		636	628	640	645

	PAPER & PAPERBOARD		2016	2017	2018 estimate	2019 forecast
12	Production	1000 m^3	859	832	840	840
	Imports		453	451	450	455
	Exports		708	658	665	670
	Apparent consumption		604	625	625	625

5. STATE AND DEVELOPMENT IN WOOD RAW PRODUCTION POTENTIAL IN SLOVAKIA

The area of forests growing on forest land in Slovakia is 1,923.4 thousand ha. In addition to forests on forest land there is about 288±39 thousand ha of forests on the non-forest land (agricultural, other) in Slovakia that were identified within the National Forest Inventory and Monitoring (NFIM) of the SR 2015-2016. The forest cover in Slovakia including forests on non-forest land is more than 45%.

Total volume of growing stock in forests according to NFIM 2015-2016 was 628±24 mil. m^3, out of which 583±23 mill. m^3 were on forest land and remaining volume of 46±7 mill. m^3 on non-forest land. According to Forest Management Plans (FMPs) the volume of growing stock just on forest land was 480.25 mill. m^3 in 2017; it is about 100 mil. m^3 less than volume of growing stock according to NFIM 2015-2016 (583±23 mill. m^3). The reasons for these differences are well justified but it is not relevant for the content of statement. The volume of growing stock has been increasing in the long term – during the last ten years has increased by 8.3% (Figure 5-1). The main reason for this increase is the current uneven age composition with over-normal share of forests older than 70 years (age classes: 8th and higher), (Figure 5-2). The present increasing trend is caused mainly by the development of growing stock of broadleaved tree species. The volume of coniferous growing stock has been decreasing since about 2010 (Figure 5-1). The development of growing stock by age classes is depicted in Figure 5-3.

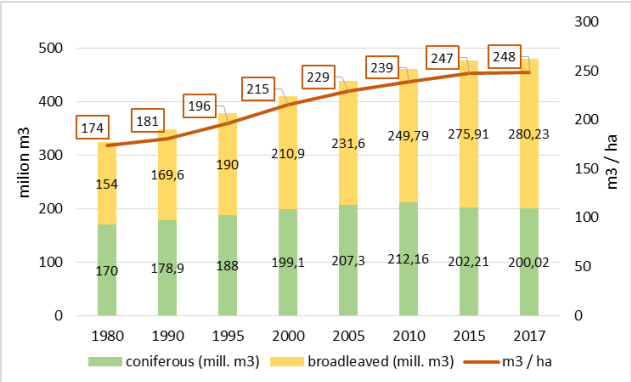


Figure 5-1 Total growing stock by main groups of tree species (coniferous, broadleaves) and per hectare

Figure 5-2 Proportion of age classes – actual and normal (ideal)

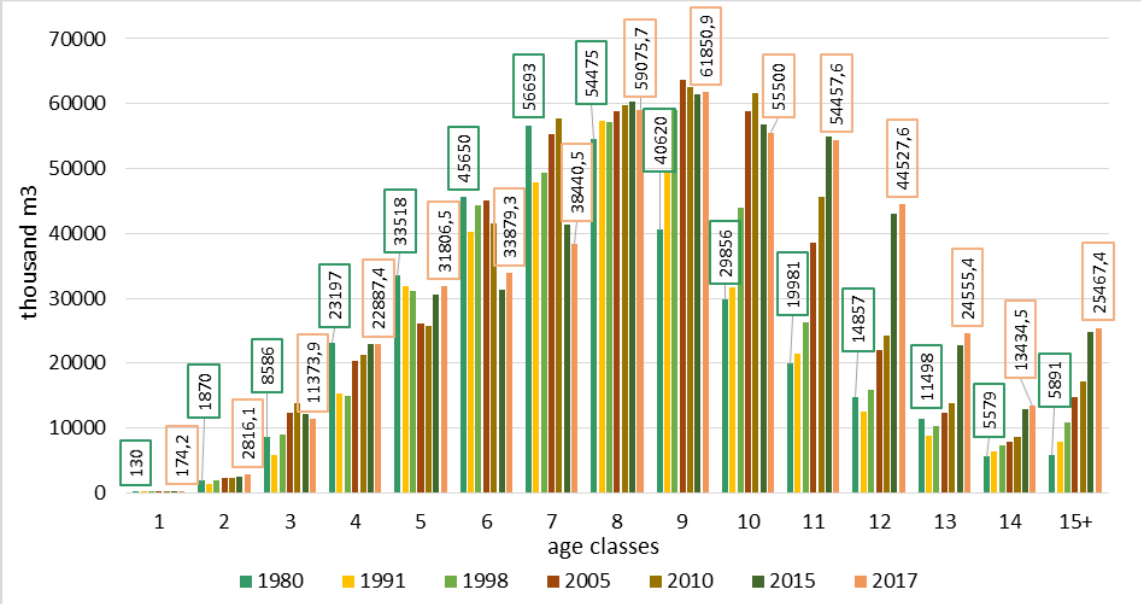


Figure 5-3 Development of growing stock by age classes since 1980

In the following figure 5-4 there is depicted distribution of growing stock by age classes and within them according to tree species.

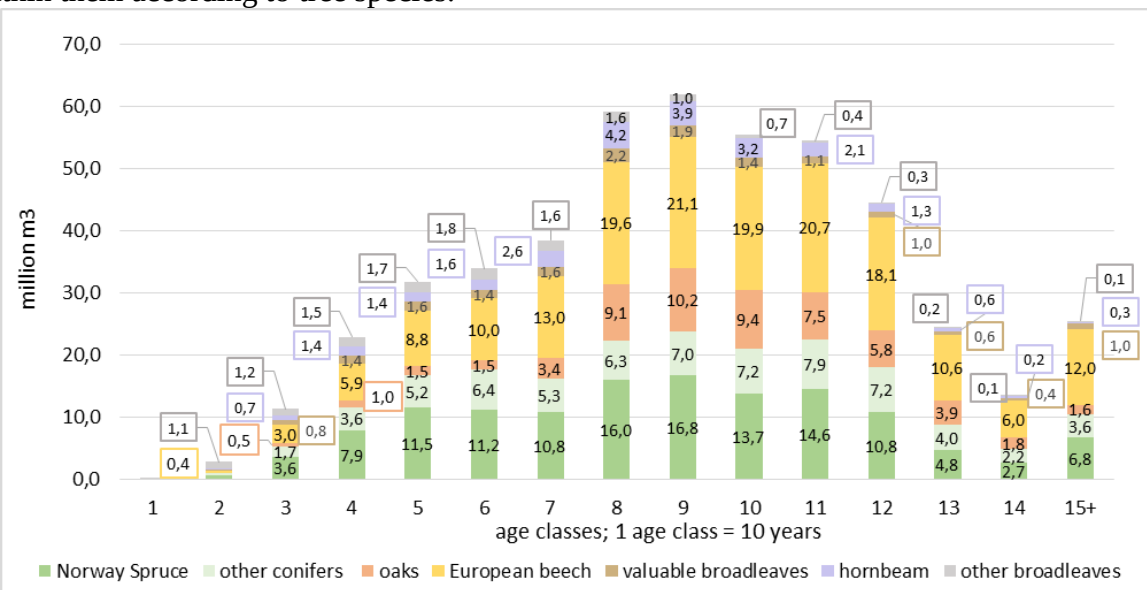


Figure 5-4 Growing stock (in million m^3) by „age classes“ and „tree species“

Due to the current state and development of forests in Slovakia we can observe some important facts:
1) gradual increase of planned felling (blue line in the Figure 5-5) mainly because of the current uneven age composition;
2) permanently higher volume of annual felling (red line) till 2010 as compared with the planned felling mainly because of high volume of incidental felling (grey line);
3) lower volume of actual felling as compared to the volume of total current increment (yellow line in the Figure 5-5).

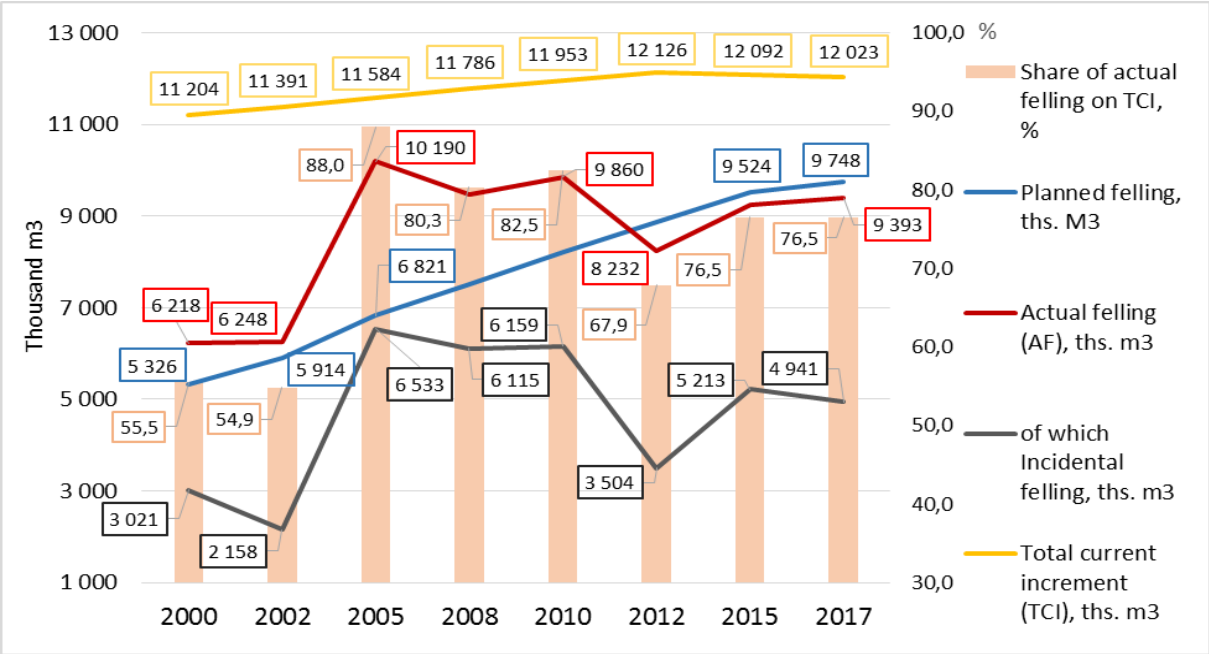


Figure 5-5 Trends in timber felling divided to „planned“, „actual“, of which „incidental“, compared to the „total current increment“ (TCI)

The total annual felling is still lower as compared to the total current increment (Fig. 5-5). Prognosis of timber felling is shown in Figure 5-7. It nearly approaches to 9 million m^3 annually until 2035.

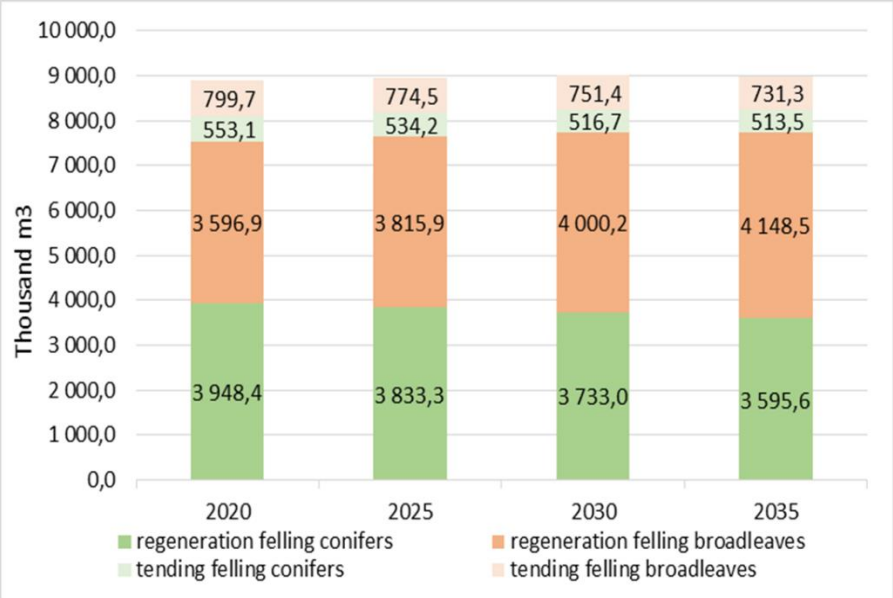


Figure 5-7 Prognosis of timber felling divided to „regeneration“ and „tending“ and by main groups of tree species: „conifers“ and „broadleaves“

Figure 5-6 illustrates the development of salvage fellings in Slovakia since 1960, broken down by groups of damaging agents that clearly demonstrates high frequency and intensity of damaging agents to which are forests exposed over the last 15-20 years.
It can be seen from the figure that if the wood damaged by abiotic damaging agents, in particular wind, is not thoroughly removed and the forest hygiene is not achieved, it will inevitably result in the damage caused by biotic damaging agents, in particular insects.

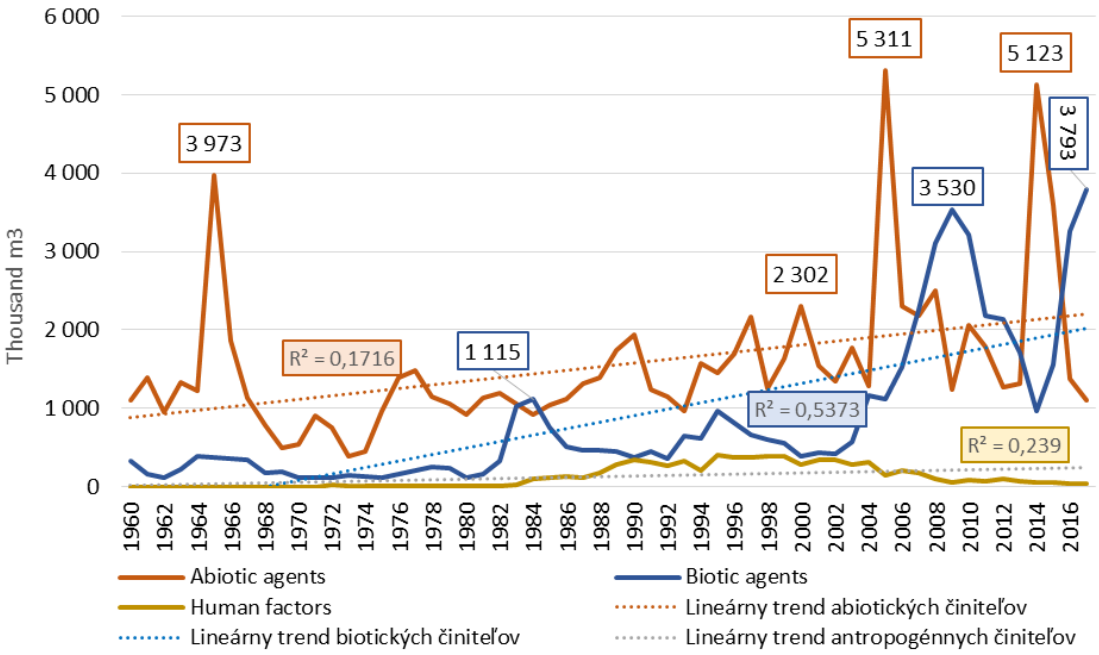


Figure 5-6 Development of the salvage fellings (thousand m^3) according to main groups of damaging agents
Source: National Forest Centre; Forest Protection Service, 2018

The distribution of volume of growing stock in Slovakian forests according to quality grades of wood assortments was derived from both information sources (FMP and NFIM) separately for both coniferous and broadleaved by the means of mathematical models of domestic assortment tables as a function of the tree diameter ($d_{1,3}$), height (h) and stem quality (A – high quality, B and C – below average) for the following tree species: beech, spruce, oak, hornbeam, pine, birch, fir, spruce. Other tree species have been assigned to the mentioned trees in view of their similarity.

Through this analysis the total growing stock in Slovakia was classified into these categories of quality grades: logs (grades: I, II, IIIA and IIIB), pulpwood (V. grade) and energy and fuelwood (VI. grade) and waste.

In order to determine the actual utilization of the available production potential we have compared the shares of model quality grades in forests in Slovakia (Tables 5-1 and 5-2) with their real shares in wood supply; for balancing annual fluctuation we used the average of supplies in 2013-2017 (Figures 4a-1 and 4a-2). Based on this analysis we can state that the potential share of quality grades of assortments in their real production has not been achieved.

It follows from this comparison that there is a lower share of quality grades I, II and III in the real structure of both groups (coniferous and broadleaved tree species) and vice versa, a higher share of grades V and VI. The real share of qualitative grades I - III in coniferous trees is lower by 12.5% and in broadleaved ones by 14.6%.

Table 5-1 Model distribution of coniferous growing stock by quality grades of wood assortments

Inventory	I	II	IIIA	IIIB	V	VI	waste
FMP (m^3, %)	4 591 150	10 249 470	87 836 900	53 590 190	42 115 380	3 555 970	33 300
	2,27	5,07	43,49	26,53	20,85	1,76	0,02
			Total III: 70,02				
NFIM (%)	3,0±0,6	4,6±0,6	40,1 ±2,6	29,1 ±1,9	21,3 ±1,1	1,8 ±0,1	0,1 ±0,0
			Total III: 69,S2				

Table 5-2 Model distribution of broadleaved growing stock by quality grades of wood assortments

Inventory	I	II	IIIA	IIIB	V	VI	waste
FMP (m^3, %)	4 810 720	21 291 110	54 030 020	71 548 300	112 742 580	13 985 210	271 830
	1,73	7,64	19,39	25,67	40,46	5,02	0,10
			Total III: 45,06				
NFIM (%)	1,8 ±0,3	6,1 ±0,5	15,1 ±0,9	25,9 ± 1,4	43,5 ±1,6	7,3 ±0,9	0,2 ±0,0
			Total III: 41				

Table 5-3 Comparison of the real and the model shares of quality grades

Indicator	I	II	III	V	VI
	Share of quality grades, %				
Real coniferous	0,06	0,11	64,51	28,84	6,48
Model coniferous	2,64	4,84	69,66	21,08	1,78
Difference: real – model	-2,58	-4,73	-5,15	7,76	4,7
Real broadleaved	0,09	0,54	36,55	55,29	7,53
Model broadleaved	1,77	6,89	43,11	42,05	6,18
Difference: real – model	-1,68	-6,35	-6,56	13,24	1,35

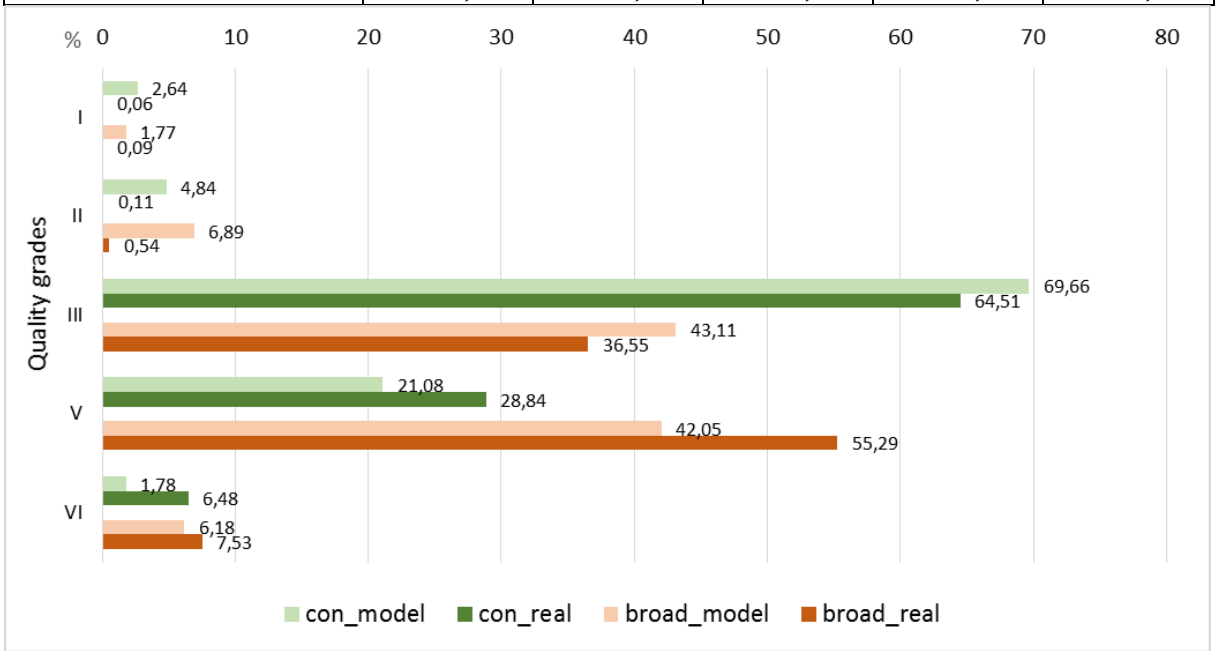


Figure 5-8 Comparison of the real and the model shares of quality grades

Worked out by Dr. Martin Moravčík, National Forest Centre – Forest Research Institute Zvolen.
15 October 2018

ACKNOWLEDGEMENTS
This paper was created with the support of project APVV-14-0869 "Research on the utilization of wood as renewable raw material in the context of green economy".

UNECE

TF1

TIMBER FORECAST QUESTIONNAIRE
Roundwood

Country:	Slovakia
Date:	03. 10. 2018
Name of Official responsible for reply:	Martin Moravčík
Official Address (in full):	National Forest Centre - Forest Research Institute, T. G. Masaryka 20, 960 92 Zvolen, Slovakia
Telephone:	+421 903401834
E-mail:	moravcik@nlcsk.org

Note: Complete only if data for 2017 have been revised.

Product Code	Product	Unit	Historical data 2016	Historical data 2017	Revised 2017	Estimate 2018	Forecast 2019
1.2.1.C	SAWLOGS AND VENEER LOGS, CONIFEROUS						
	Removals	1000 m^3 ub	3 488	3 571		3 575	3 580
	Imports	1000 m^3 ub	87 #	150 #	159	145	130
	Exports	1000 m^3 ub	1 029 #	900 #	903	860	810
	Apparent consumption	1000 m^3 ub	2 546	2 821	2 827	2 860	2 900
1.2.1.NC	SAWLOGS AND VENEER LOGS, NON-CONIFEROUS						
	Removals	1000 m^3 ub	1 514	1 509		1 510	1 520
	Imports	1000 m^3 ub	68 #	70 #	307	280	255
	Exports	1000 m^3 ub	307 #	250 #	456	435	410
	Apparent consumption	1000 m^3 ub	1 275	1 329	1 360	1 355	1 365
1.2.1.NC.T	of which, tropical logs						
	Imports	1000 m^3 ub	0 #	0 #		0	0
	Exports	1000 m^3 ub	0 #	0 #		0	0
	Net Trade	1000 m^3 ub	0	0		0	0
1.2.2.C	PULPWOOD (ROUND AND SPLIT), CONIFEROUS						
	Removals	1000 m^3 ub	1 428	1 594		1 600	1 610
	Imports	1000 m^3 ub	25 #	100 #	55	50	45
	Exports	1000 m^3 ub	366 #	250 #	442	420	400
	Apparent consumption	1000 m^3 ub	1 087	1 444	1 207	1 230	1 255
1.2.2.NC	PULPWOOD (ROUND AND SPLIT), NON-CONIFEROUS						
	Removals	1000 m^3 ub	2 289	2 040		2 060	2 075
	Imports	1000 m^3 ub	293 #	350 #	299	275	250
	Exports	1000 m^3 ub	424 #	400 #	154	145	140
	Apparent consumption	1000 m^3 ub	2 158	1 990	2 185	2 190	2 185
3	WOOD CHIPS, PARTICLES AND RESIDUES						
	Domestic supply	1000 m^3	1 200 C	1 361 C		1 200	1 200
	Imports	1000 m^3	144 C	318 C		150	150
	Exports	1000 m^3	426 C	786 C		450	450
	Apparent consumption	1000 m^3	918	893		900	900
1.2.3.C	OTHER INDUSTRIAL ROUNDWOOD, CONIFEROUS						
	Removals	1000 m^3 ub	26	36		35	35
1.2.3.NC	OTHER INDUSTRIAL ROUNDWOOD, NON-CONIFEROUS						
	Removals	1000 m^3 ub	6	21		20	20
1.1.C	WOOD FUEL, CONIFEROUS						
	Removals	1000 m^3 ub	251	318		320	320
1.1.NC	WOOD FUEL, NON-CONIFEROUS						
	Removals	1000 m^3 ub	264	273		280	290

Please return (preferably by e-mail) to Timber Section no later than 5 October 2018.

By e-mail to stats.timber@un.org.

Questions? Please contact Alex McCusker at the above address or telephone +41 22 917 2880.

The historical data are from the most recent Joint Forest Sector Questionnaire (blank) or the Timber Forecast Questionnaire (#). For explanations please see cover letter.

These data are flagged with E, R, N or C for secretariat estimate, repeat, national estimate or calculated totals (from subitems). If there is no flag, this indicates officially supplied data.

UNECE

TF2

TIMBER FORECAST QUESTIONNAIRE

Forest products

Country: Slovakia | **Date:** 3.10.2018

Name of Official responsible for reply: Martin Moravčík

Official Address (in full):

National Forest Centre - Forest Research Institute, T. G. Masaryka 20, 960 92 Zvolen, Slovakia

Telephone: +421 903401834

E-mail: moravcik@nlcsk.org

Note: Complete only if data for 2017 have been revised.

Product Code	Product	Unit	Historical data 2016	Historical data 2017	Revised 2017	Estimate 2018	Forecast 2019
6.C	SAWNWOOD, CONIFEROUS						
	Production	1000 m^3	1 200	1 306		1 315	1 325
	Imports	1000 m^3	302	235		240	245
	Exports	1000 m^3	810	667		640	620
	Apparent consumption	1000 m^3	692	873		915	950
6.NC	SAWNWOOD, NON-CONIFEROUS						
	Production	1000 m^3	380	432		450	475
	Imports	1000 m^3	30	30		30	30
	Exports	1000 m^3	179	141		150	150
	Apparent consumption	1000 m^3	232	321		330	355
6.NC.T	of which, tropical sawnwood						
	Production	1000 m^3	0	0		0	0
	Imports	1000 m^3	0	0		0	0
	Exports	1000 m^3	0	0		0	0
	Apparent consumption	1000 m^3	0	0		0	0
7	VENEER SHEETS						
	Production	1000 m^3	17 C	18 C		19	20
	Imports	1000 m^3	17 C	19 C		22	25
	Exports	1000 m^3	10 C	11 C		13	15
	Apparent consumption	1000 m^3	24	26		28	30
7.NC.T	of which, tropical veneer sheets						
	Production	1000 m^3	0	0		0	0
	Imports	1000 m^3	3	4		4	4
	Exports	1000 m^3	0	0		0	0
	Apparent consumption	1000 m^3	3	4		4	4
8.1	PLYWOOD						
	Production	1000 m^3	420 C	483 C		490	500
	Imports	1000 m^3	65 C	70 C		70	75
	Exports	1000 m^3	116 C	130 C		130	135
	Apparent consumption	1000 m^3	370	423		430	440
8.1.NC.T	of which, tropical plywood						
	Production	1000 m^3	0	0		0	0
	Imports	1000 m^3	1	1		1	1
	Exports	1000 m^3	0	0		0	0
	Apparent consumption	1000 m^3	1	1		1	1
8.2	PARTICLE BOARD (including OSB)						
	Production	1000 m^3	595	633		640	650
	Imports	1000 m^3	318	228		230	240
	Exports	1000 m^3	518	606		600	600
	Apparent consumption	1000 m^3	395	255		270	290
8.2.1	of which, OSB						
	Production	1000 m^3	0	0		0	0
	Imports	1000 m^3	75	80		80	80
	Exports	1000 m^3	1	1		1	1
	Apparent consumption	1000 m^3	74	79		79	79
8.3	FIBREBOARD						
	Production	1000 m^3	0 C	0 C		0	0
	Imports	1000 m^3	218 C	248 C		250	250
	Exports	1000 m^3	30 C	37 C		35	35
	Apparent consumption	1000 m^3	189	211		215	215
8.3.1	Hardboard						
	Production	1000 m^3	0	0		0	0
	Imports	1000 m^3	20	25		25	25
	Exports	1000 m^3	1	2		2	2
	Apparent consumption	1000 m^3	19	23		23	23
8.3.2	MDF/HDF (Medium density/high density)						
	Production	1000 m^3	0	0		0	0
	Imports	1000 m^3	139	128		130	130
	Exports	1000 m^3	28	34		33	33
	Apparent consumption	1000 m^3	112	93		97	97
8.3.3	Other fibreboard						
	Production	1000 m^3	0	0		0	0
	Imports	1000 m^3	59	95		95	95
	Exports	1000 m^3	1	0		0	0
	Apparent consumption	1000 m^3	59	95		95	95
9	WOOD PULP						
	Production	1000 m.t.	699 C	728 C		735	740
	Imports	1000 m.t.	158 C	153 C		155	155
	Exports	1000 m.t.	220 C	247 C	253	250	250
	Apparent consumption	1000 m.t.	636	634	628	640	645
12	PAPER & PAPERBOARD						
	Production	1000 m.t.	859 C	832 C		840	840
	Imports	1000 m.t.	453 C	451 C		450	455
	Exports	1000 m.t.	708 C	658 C	658	665	670
	Apparent consumption	1000 m.t.	604	625	625	625	625
5.1	WOOD PELLETS						
	Production	1000 m.t.	82	81	126	80	80
	Imports	1000 m.t.	16 E	14 E	36	35	35
	Exports	1000 m.t.	84	147		100	100
	Apparent consumption	1000 m.t.	14	-53	15	15	15

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Questions? Please contact Alex McCusker at the above address or telephone +41 22 917 2880.

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