

# **MARKET STATEMENT OF THE CZECH REPUBLIC 2020**

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## **1. BASIC TRENDS OF ECONOMY.**

The Czech Republic is a developed country that is an OECD member and belongs to rich EU countries with the most developed world economies. The Czech Republic ranked 15<sup>th</sup> place in term of human development index and is the most stable and prosperous country among the post-communistic countries. It has over 5m employees and only 100k unemployed persons. Nevertheless, the Czech economy development was surely not positive in 2019. As compared to 2018, but mainly to 2017, it slowed down and was basically the lowest since the recession from the 2009 crisis.

The decline was caused by the Czech economy facing a permanent stress of global risks through out of 2019 that were growing all the time. Czech economy, an economy that is strongly industry- and export based, was negatively influenced by the EU growth-related problems. In 2019, these and other risks demonstrated in declining growth of GDP that grew only by 2.48% year-on-year as compared to 5.2% in 2017. However, Czech economy is still coping well with long-term influence of risks on its not so great growth, even though with some difficulties.

In 2019, when the Czech Republic stopped being an assembly line and Czech industry and economy recorded dropping GDP mainly due to external reasons, in spite of major efforts, the Czech industry did not succeed in growing as it expected. The industry sector was becoming weaker already since the end of May 2019. At YE, the production of the Czech industry was still dropping, which did not help the Czech economy as its share on the gross value-added ranges around 30%.

Czech industry started to tackle the issues by not hiring new employees for the retired ones and it made employees redundant for the first time in six years. In the Czech Republic, the fast and overall growth of real salaries (3.5%) and prices (2.8%) carried out with no regard to the actual situation in the companies and while the labour efficiency grew only by 1% caused the corporate profits to drop and along with salaries growing more in public than in private sector this resulted in gradual loss of competitiveness of the most important sectors of the Czech economy.

Construction industry recorded a slight decline too. Building, i.e. construction of flats, office and warehouses, dropped by 10.5%. Civil engineering grew by 13.5%. The construction industry has major influence on the economy. It generates 360k jobs, involves 250k of various companies, suppliers, crafts as well as timber and steel industry. It is limited by the shortage of foreign workers who are the base of the industry. We build 18,390 family houses out of which 2,749 were wooden houses, i.e. one in seven houses was a wooden house.

Czech entrepreneurs being hit hard was still an impulse for establishing and extending a wide range of new, important, flexible and competitive domestic companies. Companies their products are known all over the world and hence sold with profit out of the EU countries. The products of renowned Czech companies, incl. middle-sized companies are sought after more and more often in the world. This includes e.g. nanomaterials, satellite components, digital technologies, and emerging new small-size modular nuclear reactors, etc. These new successful companies could help to restore the position of Czech industry, which it hold for long time.

Necessary progress was and is helped also by the Czech science. Domestic economy has a sound, available and prosperous support by the science. Czech scientists cooperate closely with the companies, are employed with the companies and furthermore, have contact to leading countries such as Germany, USA, Japan or South Korea. This is then reflected in the sales. Even though Czech export depends greatly on the EU (85%), USA belong to the most important export partner of the Czech Republic. This one of the most significant export destinations from the prospective of added value of the export. In long-term, USA has imported mainly jet engines, turboprop engines, pumps, tires, medicaments, and microscopes and we cooperate also on the small-size nuclear reactors as mentioned above. In the future, it will be necessary not only to maintain these trends but to extend them greatly. The Czech Republic being known as well-educated, technically and technologically developed country helps the growth and will contribute to the growth also in the future.

## **2. Timber market with Asia-Pacific countries.**

Business relations in Asia remain marginal for the Czech Republic. Annual business amount is rather small and business is done to verify the options of assumed future business potential or to tackle the consequences of forest outbreak, as in 2019. In 2019, it was possible to sell more low-quality timber to China as compared to the previous year. The timber could not be sold elsewhere and the price was fairly good as compared to Europe prices. However, this business cannot save the Czech Republic. Nevertheless, it helped Czech timber processors and the economy selling this timber that would have probably been rotting in the forests otherwise.

The Czech government is preparing an efficient programme to boost the international business, i.e. also with timber, mainly in terms of export out of the EU and with extremely long transport distances, which again stumbles over the issue of carbon footprint. Efforts are focusing on acquiring modern investments for Czech economy.

## **3. Economic trends and in logging timber.**

2019, similarly to 2018, was very adverse for the Czech forestry. It deviated greatly from the long-term temperature and precipitation average. Harmful both biotic and abiotic agents caused extensive salvage felling that amounted to 95% of the total harvested timber (roundwood (wood in the rough) and it exceeded the total of 2018 by 6.897m m<sup>3</sup>). The biggest timber producer remains the Czech State Forests (LČR) that manage approx. 45% forest and 85% of forests owned by the state.

The surplus of timber on the market caused a dramatic decline of the prices. Prices of coniferous roundwood assortments dropped extraordinarily and coniferous pulp wood was basically unsellable. Forest owners received approx. the CZK 600 per m<sup>3</sup>; however the price per m<sup>3</sup> would have to amount to the CZK 1000 to cover logging cost, forest reforestation cost and other production-related costs. Problematic were also other timber-based products (wood chips, splinters, residues, waste and saw dust), where the prices dropped too. Czech sawmills could not expect help even in this low-efficiency area and the forecast was and remains rather pessimistic.

This economic disaster influenced all forest owners in the Czech Republic. Ministry of Agriculture provided record breaking subventions to tackle the issues amounting to the CZK 734.1m, i.e. by the CZK 341m more than in 2018. The Ministry of Agriculture also provided financial contribution to mitigate bark beetle outbreak in forests totalling to the CZK 980m and some regions paid from their budgets further the CZK 70.2m.

## **4. Timber harvest and calamity.**

The main trigger of the calamity in Czech forests was the drought in 2019. Over one third of the soil suffered from drought up to one meter deep. European Space Agency provided information that the dry period lasting in the Czech Republic since 2015 was not over yet, the soil humidity was the lowest over the past six years and was the worst over the last 500 years. One-year worth precipitations are missing in the soil.

This is of advantage mainly for the European spruce bark beetle that is destroying spruce forest stands both in Bohemia and Moravia, so that the bark beetle outbreak hit each end every region. This applies not only to spruce stands. The drought hit also pines or ashes. Whereas from 1956 to 1991 salvage felling ranged around 0.25m m<sup>3</sup> of timber per year, in 1993 it amounted to 2.5m m<sup>3</sup>; in 2018 the total harvest amounted to 25.7m m<sup>3</sup> thereof 22.7m m<sup>3</sup> of salvage felling. Nevertheless, in 2019, the 2018 record was broken.

Czech Statistical Office records show that the total harvest amounted to 32.586m m<sup>3</sup> thereof 30.945m m<sup>3</sup> salvage felling, i.e. 95%. Spruce had again the highest share (90.1%) followed by pine (4.0%), beech (1.7%) and larch (1.5%). Coniferous species amounted to

96.1% of the total timber harvest; the volume of harvested coniferous timber dropped by 203k m<sup>3</sup> year-on-year, i.e. by 13.8%. Unprocessed timber amounted to 6.345m m<sup>3</sup>.

Statistical data show that the area of reforested forest stands amounted to 33,894 ha and 25,320 ha in 2019 and 2018 respectively, which means a significant increase by 8,574 ha. The annual increment of area with natural regeneration was fairly high and amounted to 1,149 ha, even though the conditions for natural regeneration are worse on calamity areas. As the annual harvest grew due to the bark beetle outbreak in the Czech Republic in the past two years, the situation on the timber market deteriorated further. Offer surplus over demand grew and as we said already, the timber prices crashed; up to 70% as compared to 2015 prices. From 200 to 2017, the annual harvest ranged from 14.4 to 19.4m m<sup>3</sup> and the processing capacities were slightly over 11m m<sup>3</sup>.

Lot of timber remained unsellable, in spite of the low price on the market. In 2019, approx. 200k m<sup>3</sup> of coniferous roundwood, 1,100k m<sup>3</sup> of coniferous pulpwood and 900k m<sup>3</sup> coniferous fuelwood (unsellable) originated from the bark beetle outbreak was stored on forest owners' stocks and the sawmills stock amounted to 600k m<sup>3</sup> of coniferous roundwood. As for the spruce affected by the bark beetle, its stock dropped by 16% according to the latest national forest inventory. There still place in the Czech Republic, where spruce is and will remain the right species. There are 2.676m ha of forests in the Czech Republic, thereof 1.3m ha are covered by spruce. There is good use for spruce in construction sector, as wooden constructions are booming and hence the wood-processing industry is and will find market potential and use for spruce. Czech wood-processing industry use spruce for various types of roof trussing, tie beams, girders, bend and glued materials and other products for construction that are also exported.

The timber price decline was so alarming that it needs to be explained. Mainly the average prices of coniferous timber were constantly dropping from Q2 2015 to Q4 2019. In 2019, the average prices of all monitored assortments dropped dramatically year-on-year when they hit the price bottom. In 2019, in some areas III A/B spruce roundwood prices amounted to the CZK 1,000 per m<sup>3</sup> but they dropped soon below this level. The originally assumed calculated average 2019 price for these assortments of the CZK 1,550/ m<sup>3</sup> could not be reached. The real price was lower by 33% as compared to 2014 prices. Dropping prices had the strongest effect on the most common assortments such as III C spruce roundwood parts where the decline totalled to 15.3%, and to 23.7% and 16.5% in case of III D and III A/B spruce roundwood parts respectively. Average prices for class V spruce timber, i.e. pulp wood, recorded a similar drop, namely 22.5%. The average price was calculated the CZK 500/m<sup>3</sup>.

But prices below the CZK 400/m<sup>3</sup> were no surprise and hence pulp wood became basically unsellable. Average annual price for coniferous fuel wood totalled to the CZK 587/m<sup>3</sup> but it was available on the market for less than the CZK 500/m<sup>3</sup>. The average prices of broad-leaved timber were growing slightly, but to no benefit.

The volume of unprocessed timber clearly indicated that sawmills had extreme volume of timber on stock; in parallel, harvesting companies had high stock of timber too. On contrary, in North Bohemia, the area hit the mostly by bark beetle outbreak, there is a shortage of healthy roundwood. They imported it from distant areas in the Czech Republic, which increased the costs. As for particle board production, the situation was also bad, where the offer exceeded the demand and therefore, the timber used for particle board production remained unsold in forests. From 2015 to 2016, the increment in particle board production amounted up to 72k m<sup>3</sup>; however from 2018 to 2019 it was only 56k m<sup>3</sup>.

Financial performance of Czech sawmills started to decline in 2019, even though it was fairly good in 2018. This trend will proceed also in 2020 and in the years to come. Even though the Czech government as well as foresters are trying to at least slow down and under favourable weather conditions in some areas to stop the effects of the bark beetle outbreak, it will not be possible to stop it soon. The indications show that the volume of desired healthy raw timber for breakdown will become scarce. We are facing problems with covering the harvest and forest regeneration costs.

## **5. RESULTS OF WOOD-PROCESSING INDUSTRY.**

In 2019, the Ministry of Industry and Trade created a new programme for small and medium-sized sawmills to facilitate processing calamity timber and acquiring interest-free credits. The programme should allow wet storing of timber, purchase of new machines, facilities and technologies as well construction, reconstruction or acquisition of needed buildings and land plots. Several companies acquired the credits and used them well.

Czech sawmills were not able to use their industry productions due to low sales of their final products, in spite of all their efforts. Therefore, the wood-processing industry reported a production decline in 2018. It partially mitigated by the paper-based and furniture industry. Nevertheless, the entire decline of Czech wood-based industry was caused by growing influence of geopolitical risks and by deteriorating sales of final products.

In spite of the problems in 2019, domestic producers have not failed. They have excellent craft traditions that were developed in the Czech Republic hundreds of years. They employ Czechs, well trained specialists and they invested well in the past. The Association of the Czech Furniture Manufacturers introduced a practical help and furniture produced in the Czech Republic is newly marked, which confirms the Czech origin.

## **6. ECONOMIC STIMULI AND FORESTRY-RELATED LEGISLATION AND POLITICAL MEASURES ADOPTED IN 2019.**

The legislation regulating Czech forestry and wood-processing industry incorporates also the EU legislation as well as other valid regulations and decrees of respective ministries or central bodies.

In 2019, Czech Government introduced new ways of handling climate change impacts on forest protection and introducing new silvicultural methods that should extend and improve forests, mainly broad-leaved forests, which again would improve the timber market.

In 2019, Czech Government adopted the following to facilitate stimuli and to improve timber market:

1. Act no. 90/2019 Sb. that allows the Ministry of Agriculture to adopt general measures waiving the forest owners from the obligation to harvest sterile, dead trees during the bark beetle outbreak, but to focus all their capacities on harvesting and sanitising affected trees that are posing a threat for further spread.
2. Act no. 314/2019 Sb., on forest protection measures laying down the obligations of professional forest managers.
3. Act no. 206/2019 Sb., amending Act no. 226/2016 Sb., on placing timber and timber products on the market. The act was amended in order to adapt the Czech La to the Regulation 2173/2005 on the establishment of a FLEGT licensing scheme for imports of timber into the European Community.
4. Decree of Ministry of Agriculture no 231/2019 Sb., regulating the checks under the Act on placing timber and timber products on the market.

Other amendments – if applicable – of decrees that were adopted in 2019 were a follow up to the legislation adopted already before 2019. These amendments replaces, extended or modified the adopted measures.

## **7. POLITICAL MEASURES RELATED TO CLIMATE CHANGE, SUPPORTING TIMBER MARKET IN 2019 and in 2H 2020.**

In 2019, climate change mitigation measures supporting Czech timber market are based on the resolutions adopted in the past. This year, they focused on mitigating adverse impact of bark beetle outbreak, climate change as such, forest protection, newly afforested areas, maintaining genetic resources as well as modernisation of forestry machines, technologies, etc.

Measures for climate change impacts on forest protection include basically the support of sustainable forestry and increase of forest ecosystem resilience, ecological value, forest stands potential, soil protection and water quality and quantity regulation. It concerns also the growing stress on using renewable resources with wood having a desired potential for further development in the Czech Republic; it is carried out also by remote sensing.

Therefore and in spite of adverse climate conditions present in the Czech Republic in the past the forest area regenerated naturally has grown, namely by 1,149 ha, even though that the conditions for natural regeneration are extremely difficult. Needed growth was also reported by the share of broad-leaved species on the artificial forest regeneration that reached 51.3%, i.e. by 6.6% more as previous year.

In the past years, extreme climate phenomena and bark beetles are becoming paramount. In 2019, increased mortality of forest species as the result both of adverse climate development persisted (high temperatures, precipitation deficit, uneven distributed precipitation) during the vegetation season, which lead to spread of various biotic harmful agents, and strong winds. The share of both coniferous and broad-leaved trees with strong defoliation increased (over 60%).

As for the forest protection, the most serious situation was the result of spruce trees damaged by bark beetle overpopulation and ongoing negative influence of high numbers of cloven-hoofed game. As for abiotic agents, damage was caused mainly by wind breaks and extensive predisposition and direct influence of ongoing drought. 2019 deviated from the long-term average temperatures. As for precipitation, 2019 was slightly below the standard (92% of standard).

As for the climate change and timber market support approved by Czech Government in 2019 and in 2H 2020, the main goal was to amend and refine some provisions of old decrees so that the new provisions are up to date with current results of forestry research and need of real life. Among others, procedures and extraordinary measures for tackling bark beetle outbreak were elaborated. Bearing tree species such as Norwegian spruce, Silver fir, Scotch pine, Small-leaved lime, Sweet cherry, European larch and sycamore were selected to improve the gene pool and clone identity. Forest after the calamity were reforested to a great extent, in selected areas projects for chemical amelioration of the soils were carried out that increased the nutrition for trees by compensation magnesium and calcium.

Investments into high-quality reproductive material, protection of amelioration and reinforcing species and into environmental and social forest functions were increased.

## **8. NEW INCENTIVES AND BENEFITS TO PRODUCING ENERGY FROM TIMBER ADOPTED BY THE GOVERNMENT.**

In 2019, wood-processing industry (WPI) processed and used 75% of derived energy from wood biomass, namely for drying timber, producing particle boards and other wood-based materials. It focused mainly on efficient and modern use of wood-derived (saw dust, harvest residues) energy. Harvest residues production grew by 8.3% and the majority was used for heat and electricity production.

The entire biomass produces approx. 22% of the electricity produced in the Czech Republic and its share on the energy from renewable sources totals to 2.5%. Water and photovoltaic plants produce approx. 0.7% and 2.7% of the gross electricity production respectively. The gross electricity production from renewable sources grew between 2017 and 2018 by 7.6%; 2019 forecast assumes lower results as compared to previous years.

The legislation for using renewable sources in the Czech Republic was adopted by the Government already in 2005 under Act no. 180/2005 Coll. that was amended several times. In 2019, Government's resolutions increased the subventions and incentives for efficient use of wood. Mainly, a programme for supporting energy production and distribution from renewable source was elaborated; this programme is orienting Czech economy on higher value added of wood processing as Czech strategic commodity. The outcome of these stimuli lead to the growth of gross value added in wood processing sectors in the Czech Republic NACE 16, 17, 18 and 31 by 6.3% in 2019. As for energy and raw material Czech policy a Council to the Government for Energy and Raw Material Strategy was established as advisory body to the Government in 2019.

## **9. SUPPORT AND MEASURES RELATED TO RESEARCH AND DEVELOPMENT CONTRIBUTING TO HIGHER TIMBER AND TIMBER BASED MARKET EFFICIENCY.**

The research and development concept for higher market efficiency, incl. timber and wood-based products was managed by the Czech Government. All measures listed in adopted documents are further elaborated and implemented by respective central administration bodies.

As for Ministry of Industry and Trade and Ministry of Agriculture that are competent in these matters, they elaborated major documents such as the "Competitiveness Analysis of the Czech Republic". This document was followed by the "Strategy of International Competitiveness" that focuses directly on support of higher market efficiency incl. incl. timber and wood-based products. This document defines the development priorities of Czech economy for a longer period of time. Government's documents reflect the introduced changes relating to the Fourth Industrial Revolution. Relevant Czech agencies focus on searching suitable and promising partners for business and cooperation relations with partners both from the EU as well as from other world countries.

In order to increase the market efficiency, private technical institutes and several regional departments were involved that have their regional mapped well usually and that can provide interesting and unusual solutions in timber production and processing. Companies focusing on issues of timber processing may apply standardly for project support under open public competitions for research, development and innovation support. Technological Agency of the Czech Republic is the grantor in this field. Projects are focusing on increasing the quality of trees to be planted in forests, introducing innovation in real life, use of wooden constructions and wood agglomerates within economy, development of light-weight façade elements with the main component being wood and glass with minimum ecological negative impacts.

For forestry research and raw wood market development the **Forestry and Game Management Research Institute (FGMRI)** was set up that handles not only projects of applied and basic research but it also introduced verified results into real life. It also provides expertise and consultancy to state administration, forest managers and forest owners.

In 2019, this applied mainly to forest protection and regeneration on areas hit by bark beetle outbreak. 13 projects of National Agency for Agricultural Research and 11 projects of Technological Agency of the Czech Republic were handled. As for international projects, the following projects proceeded: monitoring of health situation of forests, ICP Forests; „green IKK“, a project of Czech-Bavarian cross border cooperation; and ERA-NET Forest Value. Along with that the activities in international organisation such as IUFRO (International Union of Forest Research), EFI (European Forest Institute) and EUFORGEN (European Forest Genetic Resources Programme) carried on.

Also the **Faculty of Forestry and Wood Sciences of the Czech University of Life Sciences Prague** is involved in the research and development of timber market. It runs 42 projects with 36 thereof on national and 6 on international level. While running an international project, participating in scientific teams is an integral part of improving the scientific activities at the Faculty. EXTEMIT-K project proceeded, a project focusing on creating excellent scientific team to tackle current and future issues in forest ecosystems caused by climate change and to search for scientific solutions to protecting forests, the carbon absorbers; in parallel, the project EVA4.0 carried on, a project targeting on creating an Excellent Research Centre at the Faculty that focuses on tackling current and future issues in forestry and wood-processing industry in the Czech Republic caused by global changes by the means of searching excellent, scientifically validated results necessary for engagement of forestry and wood-processing sector into Industry 4.0. Given the current forestry issues (e.g. combating bark beetle outbreak), these projects may play a crucial role to tackle them.

The Faculty was involved also in other foreign projects such as (I) SUSTREE (Interreg CENTRAL EUROPE) – leading partner BFW in Vienna, (II) Silva Gabreta Monitoring (Czech-Bavarian cooperation cross border programme) – leading partner National Park Bavarian Forest, (III) Cross border mapping of forest ecosystems (Czech-Bavarian cooperation cross border programme) – leading partner National Park Šumava, (IV) FORHEAL (ERASMUS+) – leading partner University of Helsinki, (V) or (VI) Future environmentalists (ERASMUS+) – leading partner Association of Parks in Bulgaria.

Another institution active in the field is the **Faculty of Forestry and Wood Technology at Mendel University in Brno (LDF MENDELU)** that celebrated 100 years anniversary in 2019. It handled the total of 72 projects; the most significant projects comprise 2 international Horizont2020 projects. It also cooperated with Austria under Interreg AT-the Czech Republic Programme. 5 new international projects were created under ERASMUS + KA2 programme. It also cooperates on projects with the Ministry of Industry and Trade under the Application programme (1 project), Knowledge Transfer Partnership (1 project) and Trio (2 projects). The Faculty also runs applied research in form of contractual assignments.



## **10. MEASURES FOR INCREASING RESPONSIBILITY OF SOCIAL ASSOCIATIONS WITHIN FORESTRY.**

In 2019 there have been no major changes like in the past years. Measures for increasing social responsibility of social associations are handled according to the effective legislation all over the country. As for forestry, these issues are incorporated in the National Forestry Programme as a task to support the improvement social situation of forestry workers and employees.

The Government does neither regulate, nor steer towards any activities incl. social agenda. Social associations registered in forestry in the Czech Republic are voluntary, non-profit and non-government organisations. Their task is to protect the interest of citizens, workers and employees in forestry, support the increase of producers operating within forest management and for sustainable forest management. These private associations within Czech forestry help the forestry employees with maintaining social securities and dealing with social issues, legal and other consultancy, cooperation and solving problems with local authorities as well as issues of economic management and handling forest property in order to educate due managers in this area.

These associations include e.g. Forest Management Entrepreneurs' Association with the Agrarian Chamber of the Czech Republic, Czech Academy of Agricultural Sciences – Forest Management that unites employees within forestry research and university education, Association of Communal and Private Forest Owners, Czech Forest Management Entrepreneurs' Association or Forestry Self-Employed Persons' Association.

## **11. STOCK, HARVEST AND MARKET WITH RAW TIMBER.**

Total timber stock remain on good level, in spite of growing harvest in the past years, This was contributed also by the total average increment that amounted to 17.7m m<sup>3</sup> without bark, 18.0m m<sup>3</sup> without bark and 18.2m m<sup>3</sup> without bark in 2010, 2018 and 2019 respectively. The total current increment amounted to 21.2m m<sup>3</sup> without bark, 22.3m m<sup>3</sup> without bark and 22.4m m<sup>3</sup> without bark in 2010, 2018 and 2019 respectively.

The harvest of roundwood in the rough in Czech forests, i.e. the supplies to the internal market (excl. import) of coniferous and broad-leaved timber incl. coniferous and broad-leaved roundwood, pulpwood and fuelwood, amounted to 32,586k m<sup>3</sup>, i.e. a year-on-year growth by 26.9%. For comparison, in 2017 the year-on-year growth amounted to 10.11%. In 2019, salvage felling totalled to 30.9m m<sup>3</sup>. Thereof 22.78m m<sup>3</sup> was harvested due to bark beetles. Whereas the harvest per capita amounted to 1.41 m<sup>3</sup> in 2000, in 2019 it grew to 3.05 m<sup>3</sup>.

The market with all roundwood in the rough out of the Czech Republic, i.e. with coniferous and broad-leaved timber incl. coniferous and broad-leaved roundwood, pulpwood and fuelwood amounted to 8,517k m<sup>3</sup> in 2018, however on 2019 the export grew to 14,385k m<sup>3</sup>. In 2017, the export of these products amounted only to 6,801k m<sup>3</sup>. In 2018, the import amounted only to 1,460k m<sup>3</sup>, whereas in 2019, it was even less, namely 4,404k m<sup>3</sup>.

Nevertheless, we have not succeeded to sell and use fully this record-breaking timber harvest as both domestic and foreign trade were oversaturated. Part of the harvest, namely 2.2m m<sup>3</sup> increased the operational stock on timber storages both in and out of forests. Hence 200k m<sup>3</sup> of unsold spruce roundwood, 1,100 k m<sup>3</sup> of unsold spruce pulpwood and 900k m<sup>3</sup> of unsold spruce fuelwood remained on storages.

## **12. HARVEST AND MARKET WITH ROUNDWOOD.**

Harvest of coniferous and broad-leaved roundwood amounted to 19,115k m<sup>3</sup> in 2019; whereas in 2018 to 14,428k m<sup>3</sup>, i.e. the year-on-year growth by 32.5% as compared to 25.6% in 2018; thereof were 18,714k m<sup>3</sup> and 401k m<sup>3</sup> of coniferous and broad-leaved roundwood respectively. The annual harvest of coniferous roundwood grew year-on-year by 33.7% and the annual harvest of broad-leaved roundwood dropped by 7.8%. The surplus of harvest roundwood had to be exported as there was no other solution to the situation.

The export of coniferous and broad-leaved roundwood amounted to 11,706k m<sup>3</sup>, i.e. the double year-on-year growth as compared to 2018. The export of coniferous roundwood amounted to 11,474k m<sup>3</sup>, i.e. again almost the double year-on-year growth as compared to 2018. The export of broad-leaved roundwood was higher as in 2018 as it totalled to 232k m<sup>3</sup>, i.e. a year-on-year growth by 11.0%.

The import of coniferous and broad-leaved roundwood amounted to 1,111k m<sup>3</sup> as compared to 1,166k m<sup>3</sup> in 2018, i.e. a decrease by 4.7% as compared to 2018. The import of coniferous roundwood amounted to 966k m<sup>3</sup> and 990k m<sup>3</sup> in 2019 and 2018 respectively, i.e. a year-on-year drop by 2.4%. The import of broad-leaved roundwood amounted to 145k m<sup>3</sup> as compared to 176k m<sup>3</sup> in 2018, i.e. a year-on-year decline by 17.6%.

Domestic consumption of coniferous and broad-leaved roundwood amounted to 8,520k m<sup>3</sup> as compared to 9,402k m<sup>3</sup> in 2018, i.e. a year-on-year drop by 9.4 %. The consumption of coniferous roundwood amounted to 8,203k m<sup>3</sup> as compared to 9,000k m<sup>3</sup> in 2018, i.e. a year-on-year drop by 8.8 %. The consumption of broad-leaved roundwood amounted to 314k m<sup>3</sup> as compared to 402k m<sup>3</sup> in 2018, i.e. a year-on-year drop by 21.9%.

## **13. PRODUCTION AND MARKET WITH PULP WOOD.**

The harvest of coniferous and broad-leaved pulpwood amounted to 7,549k m<sup>3</sup> as compared to 7,015k m<sup>3</sup> in 2018, i.e. a year-on-year increase by 7.6% in 2019 as compared to year-on-year increase by 29.2% in 2018. The export of coniferous and broad-leaved pulpwood amounted to 2,440k m<sup>3</sup> as compared to 2,122k m<sup>3</sup> in 2018, i.e. a year-on-year increase by 15%. The import of coniferous and broad-leaved pulpwood amounted to 242k m<sup>3</sup> as compared to 262k m<sup>3</sup> in 2018, i.e. a year-on-year decrease by 7.6%.

The harvest of coniferous pulpwood amounted to 7,203k m<sup>3</sup> as compared to 6,620k m<sup>3</sup> in 2018, i.e. a year-on-year increase by 8.8% in 2019 as compared to year-on-year increase by 31.6% in 2018. The export of coniferous pulpwood amounted to 2,400k m<sup>3</sup> as compared to 2,117k m<sup>3</sup> in 2018, i.e. a year-on-year increase by 13.4%. The import of coniferous pulpwood amounted to 221k m<sup>3</sup> as compared to 256k m<sup>3</sup> in 2018, i.e. a year-on-year decrease by 13.7%.

The production of broad-leaved pulpwood amounted to 346k m<sup>3</sup> as compared to 395k m<sup>3</sup> in 2018, i.e. a year-on-year decline by 12.4%. The export of broad-leaved pulpwood amounted to 40k m<sup>3</sup> as compared to 5k m<sup>3</sup> in 2018. The import of broad-leaved pulpwood amounted to 21k m<sup>3</sup> as compared to 6k m<sup>3</sup> in 2018.

The domestic consumption of coniferous and broad-leaved pulpwood amounted to 5,351k m<sup>3</sup> as compared to 5,155k m<sup>3</sup> in 2018, i.e. a year-on-year increase by 3.8%. The domestic consumption of coniferous pulpwood amounted to 5,024k m<sup>3</sup> as compared to 4,759k in 2018, i.e. a year-on-year increase by 5,6%. The domestic consumption of broad-leaved pulpwood amounted to 327k m<sup>3</sup> as compared to 396k m<sup>3</sup> in 2018, i.e. a year-on-year decrease by 17.4%.

## **14. CONIFEROUS AND BROAD-LEAVED SAWN WOOD.**

In 2019 Czech sawmills had ready 8,700k m<sup>3</sup> of coniferous and broad-leaved roundwood ready for breakdown, i.e. by 550k m<sup>3</sup> more as in 2018, however, extensive volumes of roundwood and pulpwood were stored in forests. This was caused by the lack of suitable buyers of this timber both in CEE and elsewhere.

4,816k m<sup>3</sup> of coniferous and broad-leaved sawn wood were produced from the coniferous and broad-leaved roundwood ready for breakdown, i.e. a year-on-year increase by 266k m<sup>3</sup> and 5.85%. 4,675k m<sup>3</sup> of coniferous sawn wood were produced as compared to 4,350k m<sup>3</sup> in 2018; i.e. a year-on-year increase by 7.5%. 141k m<sup>3</sup> of broad-leaved sawn wood were produced as compared to 200 m<sup>3</sup> in 2018; i.e. a year-on-year decrease by 29.5%.

The export of coniferous and broad-leaved sawn wood amounted to 3,929k m<sup>3</sup> as compared to 3,870k m<sup>3</sup> in 2018, i.e. a year-on-year increase by 1.5%. The export of coniferous sawn wood amounted to 3,850k m<sup>3</sup> as compared to 3,750k m<sup>3</sup> in 2018, i.e. a year-on-year increase by 2.7%. The export broad-leaved sawn wood amounted to 79k m<sup>3</sup> as compared to 120 m<sup>3</sup> in 2018, i.e. a year-on-year decrease by 34.2%.

The import of coniferous and broad-leaved sawn wood amounted to 890k m<sup>3</sup> thereof 563k m<sup>3</sup> of coniferous and 327k m<sup>3</sup> of broad-leaved sawn wood.

The domestic consumption of coniferous and broad-leaved sawn wood amounted to 1,777k m<sup>3</sup>; the consumption of coniferous sawn wood increased by 6.8% and of broad-leaved by 8.96%.

Sawn wood is produced mainly by big producers such as Stora Enso Timber, s.r.o., Ždírec nad Doubravou, Stora Enso Timber Planá s.r.o., Mayer-Melnhof Holz Paskov, Pila Lukavec Sawmill and Pila Javořice Sawmill. The export of Czech coniferous and broad-leaved sawn wood amounted to 81.58% as compared to 85.05% in 2018; i.e. and decrease by 3.47%. Nevertheless, the export of sawn wood remains immense and not flattering for the Czech economy.

## **15. PRODUCTION AND MARKET WITH FUEL WOOD.**

The production of fuel wood amounted to 5,922k m<sup>3</sup> as compared to 4,246k m<sup>3</sup> in 2018, i.e. a year-on-year growth 39.5%. The export of fuel wood amounted to 239k m<sup>3</sup> as compared to 208k m<sup>3</sup> in 2018. The import was positive and grew by 34.2% year-on-year. The domestic consumption of coniferous and broad-leaved fuel wood amounted to 5,734k m<sup>3</sup> as compared to 4,076k m<sup>3</sup> in 2018, i.e. a year-on-year growth by 40.7%.

## **16. MARKET WITH OTHER WOOD BASED PRODUCTS.**

In the Czech Republic, this market with other wooden products comprises also the market with agglomerates as well as pellets and other agglomerates, chips, splinters and sawdust and wood residues. The production in 2019 is no exception to past years, except for the improvement of particle board production.

- a) **Market with particle boards incl. OSB.** The production of particle boards and OSB amounted to 1,286k m<sup>3</sup> as compared to 1,230k m<sup>3</sup> in 2018, i.e. a year-on-year growth by 4.6%. The export amounted to 1,411k m<sup>3</sup> as compared to 1,608k m<sup>3</sup> in 2018, i.e. a year-on-year drop by 12.3%. The import amounted to 864k m<sup>3</sup> with a growth by 2.9%. The domestic consumption amounted to 739k m<sup>3</sup> as compared to 462k m<sup>3</sup> in 2018, i.e. a year-on-year growth by 60.0%.
- b) **Market with fibreboards.** The production grew by 23.5% year-on-year and amounted to 42k m<sup>3</sup>. In 2019 the export grew and amounted to 284k m<sup>3</sup>, i.e. a year-on-year growth by 27.6%. The import amounted to 377k m<sup>3</sup> as compared to 246k m<sup>3</sup> in 2018. The domestic consumption amounted to 135k m<sup>3</sup> as compared to 177k m<sup>3</sup> in 2018.
- c) **Market with plywood and batten plywood.** The production of plywood and batten plywood amounted to 254k m<sup>3</sup> as compared to 234k m<sup>3</sup> in 2018, i.e. a year-on-year growth by 8.5%. The export amounted to 187k m<sup>3</sup> as compared to 178k m<sup>3</sup> in 2018, i.e. a year-on-year growth by 5.1%. The import amounted to 84k m<sup>3</sup> as compared to 98k m<sup>3</sup> in 2018, i.e. a decline by 14.3%. The domestic consumption amounted to 151k m<sup>3</sup> as compared to 154k m<sup>3</sup> in 2018, i.e. a year-on-year decline by 1.9%.
- d) **Market with wooden pellets and other agglomerates.** The production of wooden pellets and other agglomerates amounted to 608k t, thereof 466k t only pellets. The year-on-year growth in wooden pellets and other agglomerates amounted to 13.6% and in pellets only by 23.6%. The import of wooden pellets and other agglomerates amounted to 74.5k t, thereof 33.4k t only of pellets, i.e. the import of wooden pellets and other agglomerates dropped by 11.0% year-on-year and by 0.9% only of pellets. The export of wooden pellets and other agglomerates amounted to 354k t, i.e. a decrease by 12.4%. The export of pellets amounted to 305k t, i.e. a decrease by 8.1%. The domestic consumption wooden pellets and other agglomerates amounted to 328.5 t, i.e. an increase by 52.8%. The domestic consumption of pellets amounted to 195k t, i.e. an increase by 246%. As for pellets, the producers use mainly saw dust and wood shavings from own operations. As the number of boilers incinerating pellets instead of coal is growing, the consumption is rising on domestic market which is encouraging. The remaining pellets are exported to Italy, Austria and Germany.
- e) **Market with wood chips, particles and residues.** The production amounted to 1,676k m<sup>3</sup> as compared to 1,547k m<sup>3</sup> in 2018. The production of wooden chips and particles and of residues amounted to 1,011k m<sup>3</sup> and 665k m<sup>3</sup> respectively. The overall production grew by 8.3%, and the growth of wood chips and particles production amounted to 25.4% and the production of residues dropped by 10.3%. The export amounted to 507k m<sup>3</sup> as compared to 483k m<sup>3</sup> in 2018, i.e. a year-on-year growth by 4.8%. The export of wood chips and particles production amounted to 300k m<sup>3</sup> as compared to 304k m<sup>3</sup> in 2018. The import amounted to 400k m<sup>3</sup> as compared to 479k m<sup>3</sup> in 2018. The import of residues amounted to 35k m<sup>3</sup> as compared to 72k m<sup>3</sup> in 2018. The domestic consumption of wood chips and particles amounted to 1,569k m<sup>3</sup> as compared to 1,542k m<sup>3</sup> in 2018.

## **17. PRODUCTION OF PULP AND PAPER.**

According to statistical classification, the production of pulp and paper comprises paper and paper-based products as well as production of pulp, paper and cardboard.

The total consumption of wood for producing paper and viscous pulp amounted to 4,117k m<sup>3</sup> of raw coniferous wood, thereof 2,662k m<sup>3</sup> and 1,455k m<sup>3</sup> of coniferous wooden chips and splinters.

The cellulose and paper industry produced 577k t of paper pulp, thereof 553k t of chemical pulp. The paper pulp production grew by 137k t year-on-year. Moreover, 285k t of viscous pulp are produced by the Austrian company of Lenzing in its subsidiary Biocel Paskov since 2010; it changed the original technology of paper pulp production to the so-called bio purification by CO<sub>2</sub> and produced ultraviolet radiation. Viscous pulp produced in Paskov is then processed by operation of this company in Indonesia, China or directly in Austria for textile industry.

Paper, cardboard and paperboard according to CEPI classification used in cellulose and paper industry grew by 39k t year-on-year to the total of 882k t, i.e. by 4.6%.

In the Czech Republic, the structure of the production of cellulose and paper industry does not meet the domestic demand. Domestic consumption extremely exceeds the production capacities, and as not even the produced assortments meet the demand, the majority of paper must be imported (printing paper, wrapping and packaging paper). This leads to a massive loss in the foreign trade balance.

However, the company of Mondi intends to extend its paper production in the Czech Republic (to over one million of tons per year) incl. the production of whitened and non-whitened pulp as in the operation in Štětí as part of its modernisation that has been planned for long time already and assumes major investments (the Czech Republic 13 b within several years to install new cellulose mill, saw mills, boiler and other specialised machines).

Available data show that the total domestic consumption of paper, cardboard and paperboard amounted to 1,462k t; the production amounted to 882k t, 886k t were exported incl. re-export and 1,453k t of paper-based products were imported to satisfy the domestic consumption.

The domestic consumption has been growing (not only in the Czech Republic). The per capita paper consumption amounted to 150 kg. The drop in wastepaper recycling demonstrated in year-on-year comparison. 992k t of wastepaper were collected for recycling (i.e. 67.8% of domestic consumption of paper, cardboard and paperboard); thereof only 21% were recycled and the remaining 703k t were exported.

## **18. FOREST CERTIFICATION.**

The forest certification in the Czech Republic is the proof documenting that the respective forest management units are part of certified region of the Czech Republic and the companies managing these units in line with approved standards of sustainable forest management according to Czech certification system. When introducing forest certification in the Czech Republic the main idea was the support of sustainable forest management.

Forest certification is necessary. It is forest owners' facultative tool (decision) very helpful for supporting sustainable forest management. Forest owners declare with the certificate their commitment to manage the forests according to pre-defined rules. Acquiring a forest certificate and using the logo may help forest owners to place their timber on the market, even though it is not the main market criterion.

In the Czech Republic, there are two certification systems - FSC (Forest Stewardship Council) and PEFC (Programme for the Endorsement of Forest Certification Schemes). Both systems have one thing in common: the sustainable forest management principle.

**FSC® Czech Republic.** FSC ČR is the Czech representative of the international organisation of Forest Stewardship Council® (FSC) that created and maintains the certification scheme for forest certification and wood-based products in forests worldwide. At YE 2019, the forests with FSC certificate covered 113,198 ha as compared to 54,470 ha in 2018 in the Czech Republic.

**PEFC Czech Republic.** PEFC Česká republika is an independent organisation that is to support sustainable forest management, use of wood as ecological, renewable source, nature conservation and sustainable development of the society. PEFC Česká republika is part of the most spread forest certification system based in Geneva and it is the national PEFC governing body in the Czech Republic. In the Czech Republic, forests with PEFC certificate cover 1,771,054 ha. PEFC logo is an internationally known and trustworthy brand.

## **19. CONTRIBUTION OF WOOD PROCESSING INDUSTRY PRODUCTS TO PROCESSING INDUSTRY DEVELOPMENT.**

The contribution of Czech wood-processing industry (WPI) to the development of processing industry is based on statistical data and is assessed based on the following products: particle boards, sawn wood, pulpwood, veneer, plywood and batten plywood, fibre boards.

WPI the Czech Republic produced 1,286k m<sup>3</sup> of particle boards a thereof 739k m<sup>3</sup> were supplied to processing industry. In 2019, the supplies of particle boards to processing industry grew by 60% and the supplies were produced only by Czech wood-processing enterprises. This growth both documents the active contribution of WPI o industry development and is in line with sector requirements.

The supplies of coniferous and broad-leaved sawn wood to processing industry amounted to 1,777k m<sup>3</sup>; hence the annual growth of supplies totalled to 7.2%. This was also to the benefit of processing industry.

The supplies of coniferous and broad-leaved pulpwood to processing industry documented that the contribution of this product is to the benefit of processing industry similar to particle boards or sawn wood in spite of dropping pulpwood prices so that it remained almost unsellable. The pulpwood supplies grew by 7.6% year-on-year.

Also the supplies of veneer by Czech producers had positive influence on the development of the processing industry; they grew by 2.9% year-on-year.

Statistical data show that also plywood and batten plywood supplies contributed to the development of processing industry, even though that the supplies recorded a decline by 1.9%. This was caused by lower sales.

The production of fibre boards is not that developed in the Czech Republic and the product is imported. 135k m<sup>3</sup> of fibre boards were supplied to the processing industry, i.e. a year-on-year drop by 23.7% that was caused by dropping sales. The investigation showed that the supplies did not disrupt the development of individual sectors and the development was of benefit.

The figures above show that supplies of individual products delivered by WPI into processing industry have its unneglectable importance, even though its importance in economy is rather marginal. The products of WPI contribute not only to the development of the processing industry but they tight the close links and mutual beneficial dependency between domestic industry, construction sector, transport, mining and other economic areas. They facilitate finding new sales potentials, increase and improve mutual business relations and hence contribute to increasing competitiveness of the products and further development potential basically for the entire Czech economy. Products produced and supplied by WPI are of good quality, affordable and mainly competitive.

## **20. CARBON FOOTPRINT.**

In the Czech Republic the carbon footprint has been monitored for several years. Carbon footprint is anchored in the standard ČSN ISO 14064 – greenhouse gases, ISO 140067. A National programme was created and new Climate Protection Policy was drafted. In parallel, the assessment of the environmental impact of the concept, so called SEA was created too. The climate protection strategy by 2030, with outlook to 2050 and proposed measures for efficient reduction of emissions of greenhouse gases are part of this new Climate Protection Policy in the Czech Republic.

The average carbon footprint ranged around over 10 tons CO<sub>2</sub>eq. per year, which is by 3 tons CO<sub>2</sub>eq. per year more as compared to the EU. The measuring of carbon footprint of selected sample of households showed that the average carbon footprint ranges from 6 to 7 tons CO<sub>2</sub>eq. per year; it was confirmed that local heating is a major pollution source.

The share of private and corporate carbon footprint is approx. fifty fifty. A 300-m pole is erected close to Pelhřimov to measure greenhouse gas concentrations. It has been measuring the concentrations since 2010 and for the past five years, it measures 400 particles.

As for carbon footprint of forestry, it is important that we have been working on the project called Influence of tree species composition on greenhouse gas balance and on balance of other components of carbon storage. The project was assigned to Charles University Prague, Centre for Environmental Issues. The goal of the project is to evaluate the possibilities of implementation of adaptation strategies in forestry, impact on energy sector, emission balance and acceptability of given scenarios by Czech public. It should come up with various scenarios for the development of tree species and age forest structure in the Czech Republic that will take into account the climate change impacts, forest stability and the related carbon issues.

The project transfers the adaptation measures into scenarios for forest stands and production characteristics, it adds economic dimension (costs and benefits), social aspects (public preference), it connects the scenario analysis in forestry and energy industry (potential of useable biomass) and it provides the follow-up balance of greenhouse emissions from forestry (mitigation effect) and revision of emission balance of other pollutants. The outputs will comprise comprehensive forest development scenario assessment while taking into account their effects on other economy sectors and on the society. As for the costs and benefits of the commercial forest function, the modelling will assess the quantification of wood balance, effect on tree species change on the value of and produced assortments as well as on the way of its use incl. assessment of timber harvest, skidding and transporting costs.

The acceptability of individual policies will be scrutinised by structured questionnaire survey incl. collecting public approach and preference in relation to environmental characteristics and forest functions. The development of energetic system in the Czech Republic by 2050 will be predicted in order to identify optimum mix of fuel and technology for energy and heat production according to the various scenarios of biomass use. Models should contribute to creating political strategies in relation to the expected forestry development. In spite of problems e.g. with the biomass, the carbon footprint is a major part of the environmental sustainability in the Czech Republic. Czech Government, ministries, enterprises, cities as well as individuals – if possible – adopt measures to reducing the carbon footprint.