TRANSNATIONAL RESEARCH REPORT

SUSFUR: Promoting Sustainable Furniture Production in the Western Balkan through Strengthening the Linkages between Business Sector and VET Provider

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Introduction

The Transnational Research Report (D2.1) summarizes the preliminary findings of the SUSFUR project, which aims to foster sustainable furniture production in the Western Balkans through stronger connections between vocational education and training (VET) providers and the business sector. Within the context of the region's transition toward a circular economy, the furniture industry remains

a strategic yet underdeveloped sector, facing numerous challenges—from outdated production practices and limited reuse infrastructure, to skill mismatches and weak policy enforcement.

Given their heavy reliance on the wood processing sector, the Western Balkans are at a turning point in their efforts to meet European sustainability targets. The necessity of incorporating circular economy principles is emphasized in the Action Plan for the Implementation of the Sofia Declaration on the Green Agenda for the Western Balkans (2021–2030), particularly in labor-intensive industries like furniture manufacture. By examining the enabling and impeding elements that influence the adoption of circular business models (CBMs) throughout the area, this paper helps bring about this change.

The research is structured in two parts: a ***desk analysis***, which includes a review of national policy frameworks, market trends, and existing VET capacities; and a ***field analysis***, consisting of stakeholder mapping, interviews, surveys, and participatory focus groups with SMEs, VET institutions, and public agencies responsible for the furniture sector. This methodology provides a comprehensive understanding of the sector's readiness for circular transition and identifies the specific green and digital skills required for the workforce initial and continuous professional development.

As the first analytical output of the project, this report is crucial for informing the next stages of SUSFUR—specifically the development of tailored training formats, strategic up-skilling roadmaps, and digital learning platforms. The findings will also serve as a foundational input for future action plans and policy recommendations to support systemic reform in both VET and industry practices, ensuring the long-term sustainability and competitiveness of the furniture sector in the Western Balkans.

Desk research methodology

The desk research component of this report served as the foundational phase of the SUSFUR project's analytical efforts. It aimed to map the current state of the furniture production sector across the participating countries—Slovenia, the Netherlands, Albania, Montenegro, and Bosnia and Herzegovina—with a specific focus on identifying enabling and limiting factors for circular transition in both industry and vocational education and training (VET) systems.

The methodology followed a structured, comparative approach organized around five key thematic pillars relevant to sustainable furniture production and VET alignment:

1. **Furniture Sector Country Profiles**
   This section compiled macroeconomic data and structural characteristics of the national furniture sectors. It included information on the number of enterprises, total employees, production values, salary levels, and market trends. Data sources included national statistical institutes, Eurostat, industry reports, and policy documents.
2. **Legal and Institutional Framework for VET and Circular Economy**
   This section reviewed the presence and role of VET in supporting green skills in the furniture sector. It examined national qualifications frameworks, CE strategies, support instruments, and the existence of specific policy documents or national plans addressing wood and furniture processing.
3. **Material Sourcing Practices**
   The analysis evaluated the primary and secondary material sourcing strategies in each

country. It looked at the availability and use of solid wood and wood composites, patterns of wood import/export, and the extent to which local sourcing is prioritized. Forestry sector data and customs reports were cross-referenced to identify dependencies and sustainability risks.

4. **Production Technologies and Workforce Skills**
   This section assessed the technological level of the production lines (automation, digital tools, and national technology providers), workforce specialization, and existing skill gaps. It also included a preliminary evaluation of production efficiency and eco-design integration across SMEs, using available research and enterprise surveys.
5. **Waste Management and Circular Practices**
   The final pillar explored how waste is generated, managed, and reintegrated into the production cycle. It assessed the presence of curricula or training centers on circular practices, repair and reuse centers, pellet manufacturing facilities, and municipal or private furniture waste collection and treatment schemes.

To enable systematic comparison across countries, a **standardized data collection table** was compiled. Each country profile was developed using the same set of questions and indicators (as detailed in the comparative analysis table), ensuring consistency in the information collected and facilitating a meaningful cross-national analysis.

The desk research was supplemented by consultations with national stakeholders and reviews of EU and Western Balkan regional frameworks (e.g. EU Waste Framework Directive 2018/851, Circular Economy Action Plan, Sofia Declaration on the Green Agenda for the Western Balkans). These documents provided a policy benchmark for assessing the alignment of national systems with EU circular transition goals.

This desk research serves as a crucial evidence base for:

- Designing the focus group instruments in the field research phase;
- Identifying sector-specific VET needs for green up- and reskilling;
- Informing the development of training modules and digital learning resources;
- Guiding policy dialogue and capacity-building actions in later stages of the project.

Furniture sector: Country profiles

Slovenia

The wood processing and furniture industry in Slovenia is an important economic sector with a growing ability to serve Slovenian and international markets (Slovenian industry strategy, 2021). Wood processing and furniture industry in Slovenia is recognized as one of key industries in Slovenia.

In the year 2023 was self-employed companies in wood processing (C16) - 803 and 651 self employment companies in furniture production (C31). And other companies in wood processing 628 and in furniture production 420. This included 1454 Self-employment companies and 1048 companies. The distribution of the wood processing and furniture companies in Slovenia is influenced by resource availability, infrastructure, and market demand. The companies' with highest processing capacities and employment are located in rural areas close to resources these are usually wood processing companies (Figure1). Furniture production is located closer to urban centers.

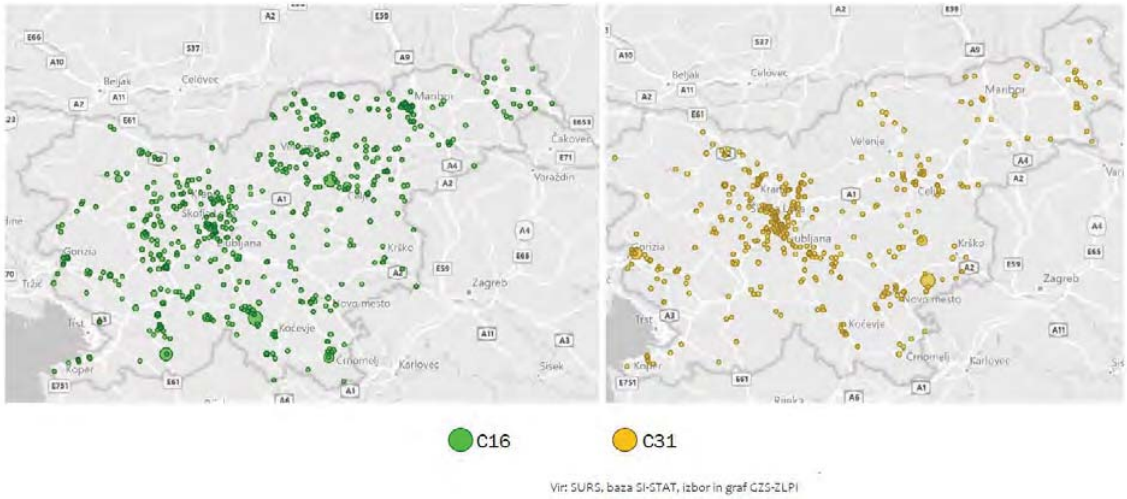


Figure 1: Geographical dispersion of companies operating in C16 and C31, self-employed companies are not shown. (Surce: Wood industry, 2024)

Employment in the wood processing sector in 2023 is down by 2.9% compared to the previous year. Employment in C16 Wood processing and manufacturing fell by 1.1%, and employment in C31 Manufacture of furniture also fell by 6.3%. The sub-sector 16.240 Manufacture of wooden packaging had a decline in employment in C16 Wood processing and manufacturing in absolute terms in 2023. In C31 Manufacture of furniture, the sub-sector 31.030 Manufacture of mattresses had the largest employment decline (**Error! Reference source not found.**2).

After the COVID-19 pandemic, employment in the wood processing industry saw a notable increase, driven by higher demand for wood products, especially in residential construction. On the other hand, the number of employees in the furniture production industry remained relatively stable. After the economic crisis in 2008, we lost some larger furniture production companies, which was the main cause of the reduction in employees until 2014 (**Error! Reference source not found.**2).

Year	2020	2021	2022	2023	Index 23/22
16 Wood Processing and Manufacturing	**7,301**	**7,695**	**8,053**	**7,966**	**98.9**
16.100 Sawmilling, Planing, and Impregnation of Wood	1,875	1,901	2,124	2,114	99.5
16.210 Manufacture of Veneer Sheets and Wood-Based Panels	894	908	931	911	97.9
16.220 Manufacture of Assembled Parquet Floors	5	6	5	6	120.0
16.230 Joinery and Carpentry	2,740	2,931	3,101	3,065	98.8

16.240 Manufacture of Wooden Packaging	460	460	449	412	91.8
16.290 Manufacture of Other Products of Wood, Cork, Straw	1,326	1,489	1,443	1,457	101.0
31 Furniture Manufacturing	**3,837**	**4,121**	**4,103**	**3,843**	**93.7**
31.010 Manufacture of Other Furniture for Business and Sales Premises	1,224	1,272	1,303	1,237	94.9
31.020 Manufacture of Kitchen Furniture	427	448	461	425	92.2
31.030 Manufacture of Mattresses	86	165	136	85	62.5
31.090 Manufacture of Other Furniture	2,100	2,236	2,203	2,096	95.1
C16+C31 Narrow Wood Industry	**11,138**	**11,816**	**12,156**	**11,808**	**97.1**
C Manufacturing Industry	**183,353**	**188,723**	**193,263**	**196,099**	**101.5**
Total Economy	**509,700**	**522,492**	**535,551**	**547,873**	**102.3**

Figure 2: Employment in the wood processing sector (2023)

Neto salary in manufacturing was €1,436.57, 9.73% higher than 2022. In C16, it was €1,241.90 in 2023, 8.01% higher than the previous year. In C31, the average net salary was €1,214.76, 10.40% higher than the previous year. The average monthly net salary in 2023 for C16 + C31 was €1,228.33, 9.18% higher than in 2022.

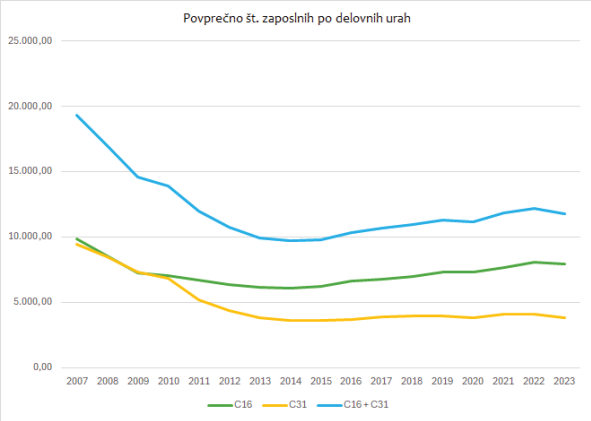


Figure 3: Number of employees in wood processing and furniture manufacturing from 2007 to 2023 (Source: Wood industry, 2024)

Since 2014, trade in goods by product activity has been increasing, with the exception of 2020, when there was a temporary drop in trade. In 2022, trade in goods was at its highest level since 2014. In 2023, however, trade in goods declined slightly.

Added value per employee in wood industry is lower than in added value in regarding the average for whole manufacturing sector. The added value is higher and closer to manufacturing in wood processing than in furniture production (C31). In 2023 was higher than 41.000 € (Figure 1).

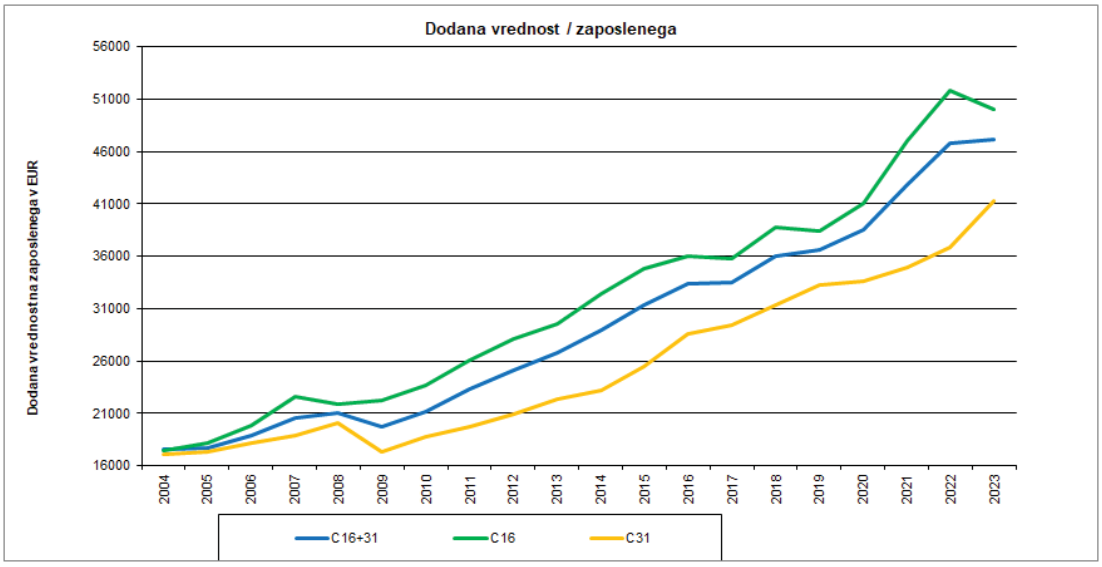


Figure 1: Growth in value added per employee

Import/ export

By product activity, Slovenia exported EUR 1,367 million of wood and furniture products in 2023, an increase of 11.29% compared to the previous year. However, it imported EUR 938 million of wood and furniture products, which means that imports increased by 7.94% compared to the previous year 2022 (Figure 2).

The most intensive destinations for timber exports in 2023 are Switzerland, Germany, Italy, Croatia and Austria. The most intensive import destinations in 2023 were Switzerland, China, Germany, Italy and Austria.

As expected, the Slovenian wood industry has the most trade exchanges with European countries, followed by Africa and Asia.

Figure 2: Trade by product activity in € 000 for C16+C31. Orange export, green import. (Source: Wood industry, 2024)

By Continent	Export (EUR)	Import (EUR)
Europe	1.087,138,638	841.421,806
Asia	101.339,715	66.508,916
Africa	101.616,776	673.941
North and Central America	25.475,919	1.586,634
South America	1.488,006	2.058,015
Oceania	927.598	2.743
Unclassified	1.490,860	16.933

Figure 3: Slovenia's trade with foreign countries by product activity in C16 + C31 in 2023

Investments

In 2023, C16 invested more in fixed assets (€107.8 million), or 0.9% more than in 2022, while C31 increased its investments by 22.6% in 2023 (investing only €33.8 million). Both sectors (C16+C31) invested well over €141.7 million in fixed assets (increasing investment by 5.3%), while manufacturing (C) invested well over €2.7 billion in fixed tangible assets or increased investment in fixed tangible assets by 16.6% (Figure 4).

The largest investments in fixed assets were made in the manufacturing sector. Recently, investments have primarily focused on the renovation and upgrading of sawmills, the production of structural timber BSH, KVH), and other building construction products. On the other hand investments drastically decrease after pandemic in furniture sector.

Figure 4: Value of investment in tangible fixed assets (Source: Wood industry, 2024)

Summary for year 2023

Revenues in the wood processing sector amounted to EUR 1,828 million (EUR 1,956 million in 2022) and expenditure to EUR 939 million (EUR 1,834 million in 2022), generating a net loss of EUR 20,823 million and a net profit of EUR 104,082 million, or a positive operating result of net profit/loss of EUR 79,772 million.

Net turnover on the domestic market decreased by 6.3% in wood processing and manufacturing compared to the previous year, and decreased by 2.6% in furniture manufacturing.

Net turnover on the foreign market decreased by 9.6% in wood processing and manufacturing compared to the previous year, and by 11.8% in furniture manufacturing.

Overall, the woodworking industry's net sales revenues on the domestic market decreased by 5.1% in 2023 compared to 2022, as did those on the foreign market by 10.0%. Total net sales revenues in the wood processing industry decreased by 7% in 2023.

Netherlands

In the Netherlands, the wood industry plays an undeniable role in the economy. It all starts with the import of wood, which reaches our borders from different corners of Europe, such as Germany, Sweden and the Baltic states. The country itself does not have large forests that produce enough wood for the entire demand, so imports are crucial. But as soon as the wood reaches the Netherlands, it ends up in the hands of companies that start processing it.

These companies are at the basis of everything we know about wood: from sturdy planks and beams to plates and other processed materials. This processed wood finds its way into the construction industry, where it is used for everything from floors and frames to roof structures. The versatility of wood makes it indispensable in residential and commercial construction. And that's not all; Wood is also a popular material in the furniture industry. Furniture makers all over the world appreciate the quality of Dutch wood, which is transformed with craftsmanship into furniture that is sold both in the Netherlands and internationally.

In recent years, the Dutch wood industry has set an important course towards sustainability. More and more companies are using wood that is certified according to standards such as FSC. This wood comes from forests that are managed responsibly, protecting the environment and biodiversity. The idea of sustainable building has therefore gained a foothold in the Netherlands. Increasingly, houses and other buildings are being built with wood as a sustainable building material, contributing to a greener future.

The timber industry in the Netherlands is therefore not only an economic powerhouse, but also an example of how a sector can adapt to the demands of the times. From the import of raw planks to the processing of sustainable wood, the story of the Dutch wood industry is one of continuous innovation and responsible business. It shows how wood – which was used as a building material for centuries – still plays a key role in the future of our society.

Company's numbers

In 2024, the Dutch furniture manufacturing sector has 11,400 enterprises and generates €1.8 billion in value added, equivalent to €102.5 per capita. The industry employs nearly 19,800 people, accounting for about 0.11% of total employment, with labor productivity valued at around €91,600 per employee. Production output is projected to reach €4.5 billion in 2025, with modest growth through 2029. In contrast to other export-focused manufacturing sub-sectors, where exports dominate, furniture production is primarily reliant on domestic consumption, accounting for roughly two-thirds of total sector sales.

According to data from Statistics Netherlands, there were 1,035 companies active in the wholesale of wood and sheet material in 2024. In addition, SGT/HOUT100% represents 78 wood-processing companies that focus on sustainable wood production. The total number of companies in the entire timber industry, including all production and trading activities, is probably higher, but precise figures are not easily available. In the Netherlands, the wood industry is an important and versatile sector that encompasses various business activities. These companies play a crucial role in the production and processing of wood, from the moment the trees leave the forest to the moment the wood is available to consumers and businesses as an end product. The timber industry plays an important role in the Dutch economy, both in terms of employment and economic contribution.

Economic contribution

Although GDP numbers for furniture are not provided individually, the industry's contribution of €1.8 billion in value added in 2024 (USD 1.97 billion estimated for 2025) underlines its consistent economic relevance and position as a fundamental component within the broader manufacturing sector. Furthermore, the sector's modest but continuous employment base of roughly 20,000 jobs indicates a solid labor footprint, emphasizing its significance to regional economies and skilled trades in the Netherlands.

These statistics confirm that, while not a leader in export-driven manufacturing, the furniture industry maintains strong local demand, significant value-added, and a specialized workforce. These dynamics highlight the importance of targeted vocational training and innovation activities, particularly in areas such as craftsmanship, CNC operation, sustainable materials, and digital design tools, for increasing productivity and sector competitiveness.

Albania

General Data on Wood Industry in Albania

The wood processing and furniture industry in Albania is an important economic sector with a growing ability to serve Albanian and international markets. Especially in the last 15 years, Albanian wood industry has been under a complete transformation process, in terms of the structure and organization of the enterprises, and also in the type of raw materials used with a greater range of choice. In the last years the wood industry's competitiveness has been improving due to the growing adoption of modern production technologies by key industry participants. This has translated into substantial growth in sales in both domestic and export markets by around 29% only in the last year.

The production value of this industry reaches about 244 million euros, almost doubling in the last 6 years. The costs and profit of this industry have followed the same development trend.

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023 (000/EUR)
Number of enterprises	1465	1401	1528	1488	1575	1354	1175	1047	910	
Wood processing	582	593	554	510	483	447	436	410	412	
Furniture	957	914	906	886	851	889	402	387	361	
Production value	12690	14056	15114	16982	18277	17279	22191	25504	24247	243,965
Value Added	3799	4480	5550	5465	5637	5842	6784	8181	8014	80,634
Total employees (Average annual number)	6854	6955	7812	8296	8565	7786	7780	7864	7495	
Total Employees/Female (Average annual number)	1567	2030	2153	2252	2406	1507	1898	1858	2204	

Total Employess/Self employed (Average annual number)	1749	1572	1518	1438	1577	1362	1187	992	733	
Total revenue	13082	14241	15810	17747	18950	17788	22823	26271	24510	246,611
Total Expenses	11829	12587	13663	15802	16983	15861	20506	23240	22425	225,632
Personnel expenses	1524	1753	2074	2368	2391	2314	2758	3157	3561	35,830
Net profit/loss	1253	1655	2147	1946	1967	1927	2317	3031	2085	20,978
Total Investments	1044	713	2089	2219	2132	2560	2356	1246	2347	23,614
Investments (Machinery and equipment)	579	359	1214	1147	915	1388	764	513	924	9,300

Table 1. *General data on Albanian wood processing and furniture industry (INSTAT, 2025)*

As can be seen from the data in table 1, there was a decrease in no. of enterprises in 2021, especially in the furniture industry, as an effect of the COVID-19 pandemic. Almost half of the companies in the furniture industry have closed their activity due to COVID-19, mostly micro-enterprises with less than 4 employees.

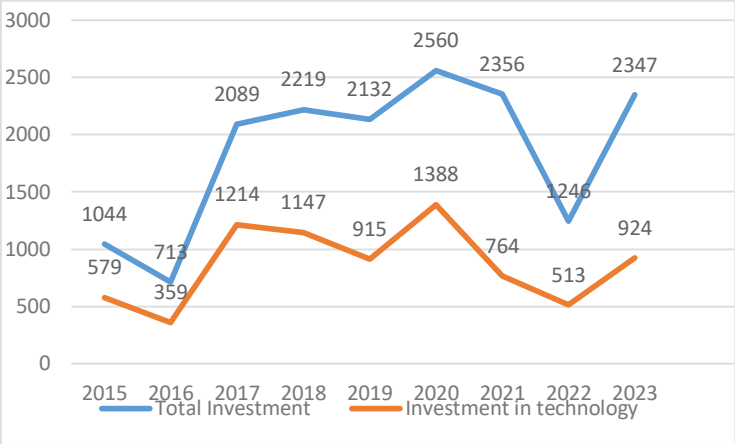
In general, wood and furniture industry enterprises are small and medium-sized enterprises with an average of 10 employees. Of about 8000 people employed in this industry, almost 10% of employees are self-employed in micro-enterprises with less than 4 employees, a form that is very widespread in big cities, producing furniture for urban residents. Many of the necessary furniture production processes are carried out with third parties.

About 30 % of the employed workforce are women, with an increase of 5% in the last year (2023). It is noticabe a small decrease in the workforce in the last year, this number has not yet reached the pre-pandemic level. The number of women employees, which in 2019 comprised almost 29% of the number of employees has reached the same level, accounting for about 29.5 % of the employees.

More than 90 percent of raw materials, primarily wood-based panels for domestic furniture industry, are imported. This development is also conditioned by the inability of Albania's forest resources to supply the wood and furniture industry with raw material, due to their degraded state.

In 2016 the Albanian government announced a general moratorium in forest sector (Law No. 5/2016, February 4, 2016 “For the declaration of the moratorium in the forests in the RoA). The purpose of this law is to reduce interventions on the forest fund, which is reduced because of overexploitation and other damage, and aims towards improving and restoring its condition. The duration of the moratorium is 10 (ten) years from the date of the entry of law into force. The object of this law is the ban of commercial harvesting activities in the public/private forest fund throughout the territory of the Republic of Albania, the trading of harvested timber products, the ban of the export of raw timber, timber construction material, firewood, as well as wood charcoal.

Despite this situation, the wood and furniture industry has continued to invest in capacity expansion and new technologies.



Graph 1. *Trend of the investments in mill. ALL in wood processing and furniture industry (INSTAT, 2025)*

In Graph 1 is shown the trend of the investments for the period 2015 – 2023. Despite their decrease in 2021, at the level of 19 Mill. Euro, as an effect of the COVID 19 pandemic, total investments as well as those in new technologies have doubled in the mentioned period. It is estimated that this trend of investment growth will continue in 2024.

The component of investments in machinery and equipment has the same upward trend. It is mainly about investments in machinery or CNC production lines.

Material costs make up the most important item of total expenses with about 70% of them. Labor costs make up almost 12-15% of total costs and regardless of the rapid increase in wages in this industry in the last 2 years, especially for engineers and specialized workers, the perception remains that the level of wages in the wood and furniture industry is relatively low. This low level of wages remains one of the main factors of the lack of labor force that this industry is facing in recent years.

As shown in the table 2 the average gross monthly salary in the industry sector in Albania is less than 350 euro. The average gross monthly salary for female employees is about 300 Euro, or 33% less than the male employees.

Year	2017	2018	2019	2020	2021
Total	31219	32756	34283	34714	38967
Male	40296	42102	43501	43143	47810
Female	27767	29198	30823	31170	35412

Table 2. *Average gross monthly salary in ALL (INSTAT, 2023)*

Export/Import

Nowadays, wood processing and furniture industry meets a considerable part of the Albanian domestic market needs with wooden products targeting mainly low-cost products for low-income customers, while import of furniture products continues and expands mainly for high class well-developed modern furniture.

Being a small market, the possibility of capacity expansion based on the local market is impossible, so more and more companies are oriented towards export.

Albania also imports significant volumes of ready-made furniture, including office, kitchen, and other furniture. Office and kitchen furniture are imported primarily from Italy.

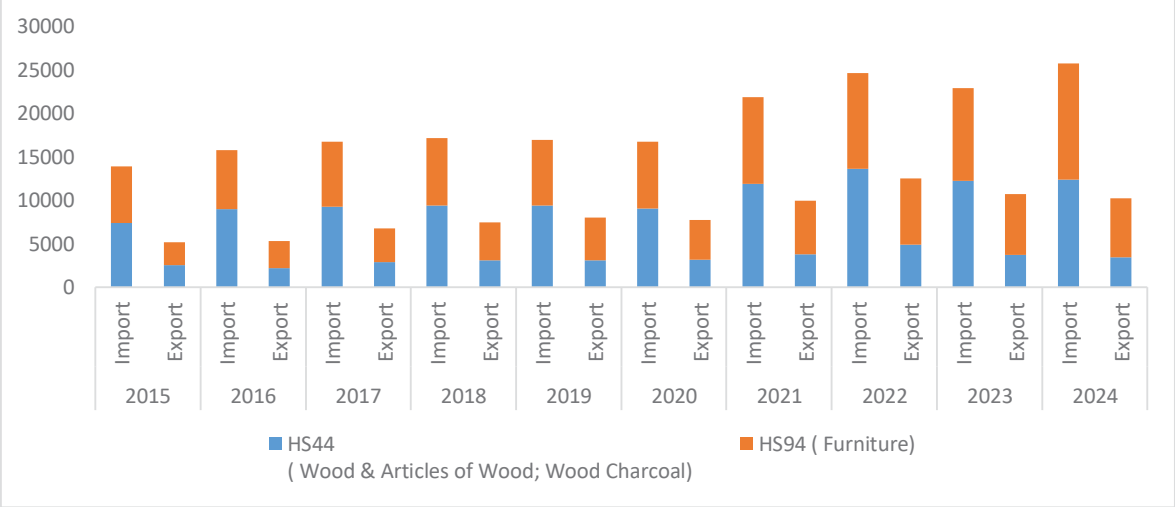
The main products produced in-country and exported are semi-finished elements for chairs, tables, and other articles for export, chairs, bedroom furniture, tables, doors, windows, and flooring.

Year	Value (million/ALL)										Value (000/EUR)
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2024
Total Imports HS44	7380	8993	8531	9263	9413	9039	11868	13597	12216	12357	124,332
Total Exports HS44	2520	2168	2442	2912	3089	3172	3753	4858	3738	3425	34,46

The value of exports of goods of chapter 44 of the HS system has reached in 2024 about 34 million euro with an decrease of 8.8 % compared to the previous year, anyways surpassing the level of exports before the pandemic.

Imports of goods of chapter 44 of the HS system are about 124 million euros or more than three times higher than exports. The upward trend is very clear, exceeding the pandemic levels by about 31%.

This trend reinforces the statement made above that the wood and furniture industry is experiencing a clear upward trend.



Graph 2. *Trend of exports and imports (2015-2024) according to Harmonized System (HS of tariff clasification) in mill. ALL in wood processing and furniture industry (INSTAT, 2025)*

Montenegro

The wood industry in Montenegro is part of a broader classification system that includes the furniture manufacturing industry. Consequently, the subsequent data will be extracted from the manufacturing sector exclusively for the purpose of wood processing.

	2017	***2018***	***2019***	***2020***	***2021***
Gross added value	137.803	149.727	150.261,2	124.855,5	143.249,5

Table 1: Results by sectors – manufacturing industry; in thousands €

The data is presented in Table 1, which illustrates the gross added value of the manufacturing industry from 2017 to 2021. It is evident that there has been an increase in manufacturing throughout the observed period, with the exception of the year in which the global pandemic occurred.

	2017	***2018***	***2019***	***2020***	***2021***
Manufacturing total	97	112,1	90	99,5	109,1
Manufacture of wood and of products of wood and cork	100,7	102	127,8	84,5	121,8
Manufacture of furniture	148,7	124,9	162,4	63	123,2

Table 2: Indices of industrial production by groups – in %

Import and export of manufacturing industry

The economy of Montenegro is in a developmental process characterized by sustained growth. In that sense, there are several areas in which individuals involved in governance are currently engaged. Last year, a change was initiated by the implementation of strategies related to smart specialization or sustainable practices, which were identified as a primary catalyst for this shift. All of the aforementioned have to do with the manufacturing industry in Montenegro.

The manufacturing industry of Montenegro encompasses all industry activities related to the production of final and semi-final goods. Accordingly, the wood industry is also considered part of the manufacturing industry.

The wood industry has obtained the following results under the code 24 for import and export. Despite its predominantly import-oriented economic profile, Montenegro's wood industry is characterized by a notable absence of substantial manufacturing and real production capacity. Consequently, the export of wood and wood industry products emerges as the nation's paramount export sector.

	2017	***2018***	***2019***	***2020***	***2021***
Code 24: Wood and products of wood, wood charcoal	30.604.496	29.078.511	34.994.452	31.599.100	37.540.453

Table 3: Export in period 2017-2021 – by qualification; in thousands €

	2017	***2018***	***2019***	***2020***	***2021***
Code 24: Cork and wood	4.408.359	5.098.392	9.352.027	5.746.908	5.238.181

Table 4: Import in period of 2017-2021 – by qualification; in thousands €

As illustrated in the subsequent tables, the export of MNE in relation to the wood industry is notably higher than the import.

Structure of companies in wood industry of Montenegro

The wood industry of Montenegro consists of various enterprises, ranging from micro to medium-sized businesses (data from 2021):

- Micro enterprises (1-9 employees): 430;
- Small enterprises (10-49 employees): 57;
- Medium enterprises (50-250 employees): 11.

The total number of employees in the wood industry in 2021 was 2.806 workers, with the highest concentration in the following municipalities:

- Bijelo Polje: 496;
- Nikšić: 434;
- Rožaje: 379;
- Podgorica: 360;
- Berane: 311;
- Pljevlja: 258;
- Kolašin: 120.

In other municipalities, employment is below 50 workers, except for Ulcinj, where 97 workers are employed.

	2017	***2018***	***2019***	***2020***	***2021***
Number of companies	465	498	512	525	498
Number of employees (total)	2.650	2.700	2.800	2.900	2.806

Table 5: The number of companies within wood industry in MNE (Source: Monstat and BI Consulting)

Bosnia and Herzegovina

Bosnia and Herzegovina (BiH) is a country rich in natural resources, particularly its extensive forests, which play a vital role in its economy. The wood processing and furniture industry represents one of the key industrial sectors, significantly contributing to both employment and exports. This report provides a comprehensive analysis of the country's forestry resources, wood industry structure, production trends, waste management practices, and export performance. The aim is to highlight the opportunities and challenges within the sector while providing insights into policy frameworks and market dynamics.

The wood processing industry consists of approximately 1,500 companies, ranging from small craft workshops to large-scale manufacturers.

Type of Company	**Number of Companies**
Sawmills	800+
Furniture Manufacturers	500+
Wood Panel Producers	100+

Table 2: Breakdown of Wood Industry Companies (Source: The Wood Industry of BiH Performance and Export Analysis, 2023)

According to the official data of Foreign Chamber of Commerce (Source: Infokom-91, Foreign Trade Chamber of BiH, 2025) the value of exports in the wood industry for the first nine months of 2024 amounted to 1,233,177,564 KM, which is 8.4% less than exports for the same period in 2023, when it amounted to 1,345,955,313 KM.

At the same time, the value of imports in the wood industry for the first nine months of 2024 amounted to 407,688,862 KM, which is 8.1% less than imports for the same period in 2023, when the value of imports amounted to 443,688,862 KM. The total trade volume of foreign trade exchange in the wood industry for the first nine months of 2024 amounted to 1,640,866,862 KM.

In the first nine months of 2024, compared to the same period in 2023, a decline in exports of all product groups was recorded, except for unprocessed wood, which increased both in quantity (124%) and in value (118%). The reason for this is undoubtedly the lifting of the suspension on the export of

forest timber assortments from Bosnia and Herzegovina. A decline in exports was recorded for other forestry products, furniture, prefabricated houses, construction carpentry, and parquet flooring.

Furniture accounted for 42% of total exports, amounting to 520 million KM, which is 9% less compared to the first nine months of 2023, when exports amounted to 570 million KM. There are indications that these declines are short-term effects caused by the temporarily reduced demand in foreign markets and that these trade balances will improve by the end of the year.

Regarding imports in the first nine months of 2024, almost all product groups recorded a decline in imports. Companies are making great efforts to maintain production, preserve jobs, and achieve good export results despite the newly emerging economic crisis. Due to a significant increase in the prices of raw materials, companies have had to—and will continue to have to—adjust the selling prices of finished products while ensuring they remain competitive.

As a result of disruptions in the German market, which is the main export market for Bosnian companies, and due to the continuous decline in orders, it is necessary to consider opening new markets, both within the EU and in non-EU countries.

Producers in Bosnia and Herzegovina need the adoption and implementation of measures to stimulate exports, retain and develop human resources, and ensure sufficient raw materials. Additionally, it is essential to develop a network for promoting the potential of Bosnia and Herzegovina to diversify markets.

Employment and Economic Contribution

The furniture sector in BiH employs over 40,000 workers, making it one of the country's largest manufacturing employers. It contributes notably to the national GDP and ranks among BiH's top export-earning industries, particularly through trade with EU markets. The sector's continued growth is supported by investments in modern equipment and increasing adoption of sustainable production practices, reinforcing its role as a key driver of industrial employment and economic output.

The industry has historically enjoyed strong export momentum—furniture accounted for nearly 47 % of wood-processed export value in 2011, amounting to 377 million BAM, and export volumes continued to grow into the early 2020s. In 2023, total wood-sector exports reached approximately 1.59 billion BAM, with 43 % of this—roughly 657 million BAM—coming specifically from furniture and upholstered products.

VET and legal framework

Slovenia

Slovenia has one of the highest participation rates in vocational education and training (VET) at the upper secondary level in the EU. The VET system is well-established, attractive, and flexible, offering diverse learning pathways and strong progression opportunities. It plays a key role in supporting the country's economic development and addressing demographic and labor market challenges.

Key Features:

- **Widespread Access**: VET schools are geographically distributed, ensuring accessibility for students across the country and supporting local labor markets.
- **Dual System**: Includes both school-based and apprenticeship pathways, with increasing emphasis on work-based learning (WBL) through intercompany training centers (MICs).
- **Higher Vocational Education**: Two-year post-secondary programs (EQF level 5) focus on applied skills in areas such as wood technology and production management.
- **Adult Learning**: Lifelong learning and upskilling are national priorities, especially in response to digitalization and an aging workforce.
- **Quality Assurance**: A national framework ensures continuous improvement through self-evaluation, external reviews, and stakeholder involvement.
- **Governance**: VET is centrally coordinated by the Ministry of Education, with strong involvement from social partners, chambers, and public institutions.

Recent Developments:

- Introduction of a modern apprenticeship system.
- Strategic focus on digital and green skills.
- Development of new continuing VET (CVET) programs for employed adults.
- Implementation of the Slovenian Qualifications Framework (SQF) aligned with the EQF.

Challenges:

- Adapting to demographic decline and labor market mismatches.
- Increasing adult participation in lifelong learning.
- Enhancing digital competencies and teacher training.
- Expanding apprenticeship models and improving WBL quality.

VET in the Wood Sector

In the field of wood science and technology, VET is primarily delivered through:

Secondary vocational schools offering programs in carpentry, woodworking, and furniture design. Vocational secondary schools specializing in the wood industry are geographically distributed across Slovenia. This ensures that students can access education close to their place of residence. At the same time, it enables companies to recruit skilled labor locally, as most wood industry enterprises are also spread throughout the country. This regional alignment between education providers and industry supports both workforce development and local economic growth.

In addition to secondary education, **higher vocational colleges** offer two-year post-secondary programs focused on applied wood technology and production management. Some secondary schools also provide these programs, which tend to attract more motivated students—particularly those who prefer to remain in the wood industry rather than pursue university-level education.

The curricula of these programs are generally similar and often extend beyond wood as a material. Many include training in the use of other materials and emphasize design and furniture production, reflecting the evolving needs of the sector. These programs play a crucial role in equipping students with practical skills and specialized knowledge tailored to the demands of modern wood and furniture industries (https://visja.lsmb.si/)

Strengths

- Strong industry-school cooperation, especially in carpentry and furniture-making.
- Access to modern equipment (e.g., CNC machines) in some training centers.
- Growing integration of sustainability and digital skills into curricula.

Challenges

- Limited specialization in advanced wood technologies (e.g., CLT, glulam, robotics).
- Shortage of instructors with up-to-date industry experience.
- Need for greater alignment with circular economy principles and green transition goals 2.

Slovenia's VET system is currently undergoing modernization to better support the digital and green transitions, including in the wood sector. This includes updating curricula, investing in infrastructure, and strengthening partnerships between schools and companies.

A key strength of the Slovenian VET system is the integration of Higher Vocational Colleges (HVCs) within some secondary schools. These institutions offer two-year post-secondary programs (EQF level 5) focused on applied wood technology, production management, and related fields. These programs are particularly attractive to students who wish to remain in the wood industry but do not plan to pursue university-level education.

Currently, four secondary schools in Slovenia also operate Higher Vocational Colleges with programs relevant to the wood and furniture sector:

- Šolski center Celje – Višja strokovna šola

Location: Celje
Offers programs in wood technology and related applied sciences.

- Šolski center Ljubljana – Višja strokovna šola

Location: Ljubljana
Known for its programs in design and furniture production.

- Šolski center Nova Gorica – Višja strokovna šola

Location: Nova GoricaOffers applied programs in sustainable materials and interior

design.

- Šolski center Maribor – Višja strokovna šola

Location: Maribor
Focuses on wood processing technologies and production systems.

In addition, Slovenia has established one national VET training center—the Intercompany Training Center (MIC)—which supports practical training, lifelong learning, and cooperation between schools and local industries. These centers are essential for delivering work-based learning (WBL) and ensuring that students gain hands-on experience in real industrial settings.

In addition to vocational secondary schools and higher vocational colleges, Slovenia also hosts several higher education institutions that are directly or indirectly connected to the wood industry, particularly through design, engineering, and sustainability-focused programs.

Like Higher School of Design (Visoka šola za dizajn) Located in Ljubljana, this institution offers programs in interior and product design, with a portion of the curriculum dedicated to wood-based design. Students frequently engage in project-based assignments that explore wood reuse and recycling, contributing to sustainable design practices. The school emphasizes creativity, innovation, and ecological responsibility in material selection and design processes.

And we have one higher education institution Department of Wood Science and Technology – University of Ljubljana

It offers a comprehensive educational pathway across three levels:

- Professional Higher Education Program: Wood Engineering
- University Bachelor Program: Wood Science and Technology (BSc)
- Master's Program: Wood Science and Technology (MSc)

Additionally, students can pursue a PhD in Wood Science through the Interdisciplinary Doctoral Program in Biosciences, which includes modules focused on wood materials, processing, and sustainability.

Across all study levels, students gain foundational knowledge in circular economy principles and cascade use of wood, preparing them to contribute to sustainable development and resource-efficient practices in the wood sector.

These institutions play a vital role in maintaining a skilled workforce in the wood industry and contribute to the sector's innovation and sustainability.

National plan and support for furniture sector

In Slovenia, there are two key strategic documents that guide the development of the furniture and wood-based interior sector:

1. Strategic Research and Innovation Partnership (SRIP) – Smart Buildings and the Wood Chain (SRIP PSiDL)

This partnership focuses primarily on energy-efficient wooden construction and the integration of furniture and interior equipment into sustainable building solutions. It promotes innovation, digitalization, and the use of wood in smart, low-energy buildings, supporting the development of high-

value-added products and systems for modern living environments (https://pametne-stavbe.com/) (2025).

2. Implementation Plan for Measures to Develop the Wood-Processing Industry until 2030

This national plan provides a comprehensive roadmap for strengthening the entire wood value chain, including the furniture industry. It emphasizes investment in production capacity, digital transformation, workforce development, and the promotion of wood use in both public and private sectors. The plan also supports the creation of regional wood-processing centers and encourages the development of design-driven, high-quality furniture products (Internal document, 2022).

Summary:

This implementation plan operationalizes the goals of the Slovenian Industrial Strategy 2021–2030, recognizing the wood processing industry as a strategic sector for sustainable development and the circular economy. It aims to increase the domestic use of wood, enhance value chains, and reduce raw material exports.

Strategic Goals by 2030:

- Increase annual sales in the wood industry to €2.5 billion.
- Process 3 million m^3 of roundwood annually into high-value products.
- Raise employment in wood-related sectors to 15.000.
- Achieve 50% wood content in all new public buildings.
- Strengthen the business environment and innovation capacity.

Key Measures (Grouped into 7 Thematic Areas):

- Business Environment
  - Establish regional wood processing centers based on circular economy principles.
  - Introduce green tax policies (e.g., reduced VAT for wood products).
  - Support start-ups and innovation incubators in the wood sector.
- Investment in Processing Capacity
  - Support for modernizing primary processing (especially low-quality wood).
  - Promote investment in engineered wood products (e.g., CLT, LVL).
  - Encourage development of biorefineries and non-traditional wood products.
- Raw Material Supply
  - Improve collection and sorting of wood residues and used wood.
  - Adapt industry to changing forest composition due to climate change.
- Digitalization and Business Models
  - Support digital transformation and cybersecurity in wood companies.
  - Promote new business models and cross-sector partnerships.
- Human Resources and Education
  - Modernize educational programs at all levels with interdisciplinary content.
  - Introduce dual education and lifelong learning systems.
  - Offer scholarships and promote wood-related careers.
- Research, Development, and Innovation
  - Fund interdisciplinary R&D programs and CRP projects.
  - Support patenting and commercialization of wood innovations.

    - Establish R&D departments in companies and link them with academia.
- Promotion and Use of Wood
    - Increase wood use in public procurement (Green Public Procurement).
    - Develop the "Slovenski les" brand and the SI GREEN Label.
    - Promote wood through communication strategies and demonstration projects.

Stakeholder Involvement

The plan was co-created with over 80 stakeholders, including industry representatives, research institutions, ministries, and regional development agencies. It emphasizes systemic collaboration and interdisciplinary innovation.

Planned Financial Mechanisms for Implementation

1. Public Funding Sources

- European Structural and Investment Funds (ESIF): Co-financing for infrastructure, technological modernization, and research.
- Recovery and Resilience Plan (RRP): Support for the green transition, digitalization, and sustainable wood use.
- Climate Change Fund: Incentives for wood use, CO_2 emission reduction, and support for sustainable practices.
- Eco Fund: Subsidies for energy-efficient wooden construction and renovation.
- ARRS (Slovenian Research Agency): Stable funding for research programs and targeted research projects (CRP).
- Slovenian Enterprise Fund (SPS) and SPIRIT Slovenia: Support for entrepreneurship, internationalization, and innovation.

2. Tax Incentives

- Reduced VAT for wood and furniture products.
- Tax deductions for investments in equipment and intangible assets (increase from 40% to 80%).
- Corporate tax base reductions for companies investing in wooden products and equipment.

3. Direct Investment Support

- Co-financing of new facilities for primary and secondary wood processing.
- Support for digital transformation and production automation.
- Investments in biorefineries and non-traditional wood processing plants.
- Incentives for establishing regional wood-processing centers.

4. Support for Research and Development

- Research vouchers for collaboration between companies and research institutions.
- Co-financing of PhD students employed in companies.
- Support for patenting and acquisition of innovations.
- Funding for preparing project proposals for international calls (e.g., Horizon Europe).

5. Support for Education and Human Resources

- Subsidies for vocational scholarships.
- Co-financing of education and training (including lifelong learning).
- Investments in educational and research equipment for practical training.

Current support System for the Wood Sector in Slovenia

Slovenia has developed a comprehensive support framework for the wood-processing and furniture industry, coordinated primarily by the Directorate for Wood Industry under the Ministry of the Economy, Tourism and Sport. The system includes financial incentives, policy development, promotional activities, and support for education and innovation (Source: https://www.gov.si/drzavni-organi/ministrstva/ministrstvo-za-gospodarstvo-turizem-in-sport/o-ministrstvu/direktorat-za-lesarstvo/ (2025).

1. Directorate for Wood Industry

The Directorate plays a central role in:

- Improving competitiveness of the wood sector.
- Creating a stable business environment for wood-processing companies.
- Strengthening forest-wood value chains.
- Promoting the use of wood and wood products in construction and design.
- Providing financial incentives through public calls for:
    - Development of new products and semi-products.
    - Modernization of technological and production processes.
    - Launching new wood-based enterprises.
- Supporting education and training of professionals in the sector.
- Co-financing participation in international trade fairs.
- Promoting wood use through demo buildings and public campaigns

2. Sector for Development Incentives in Wood Industry

This sector focuses on:

- Implementing national policies and financial measures for the wood industry.
- Encouraging collaboration among stakeholders.
- Supporting the transition to a low-carbon economy.
- Funding equipment upgrades and new technologies.
- Promoting standards and certifications for quality and safety

3. Additional Support Institutions

- SPIRIT Slovenia: Supports internationalization, innovation, and entrepreneurship in the wood sector.
- Eco Fund: Provides subsidies for energy-efficient wooden buildings and renovations.
- Slovenian Research Agency (ARRS): Funds research programs and targeted projects in wood science and technology.
- Slovenian Enterprise Fund (SPS): Offers financial instruments for SMEs, including those in wood processing.
- Climate Change Fund: Supports sustainable practices and emission reduction in wood logistics and production.

4. Strategic Focus Areas

- Circular economy and green transition.
- Digital transformation and automation.
- Education and workforce development.
- Research, development, and innovation.
- Promotion of Slovenian wood and branding (e.g., SI GREEN Label)

Sectorial Support and Industry Representation

In addition to institutional support from ministries and public agencies, Slovenia's wood-processing sector benefits from strong sectoral representation and coordination through professional associations.

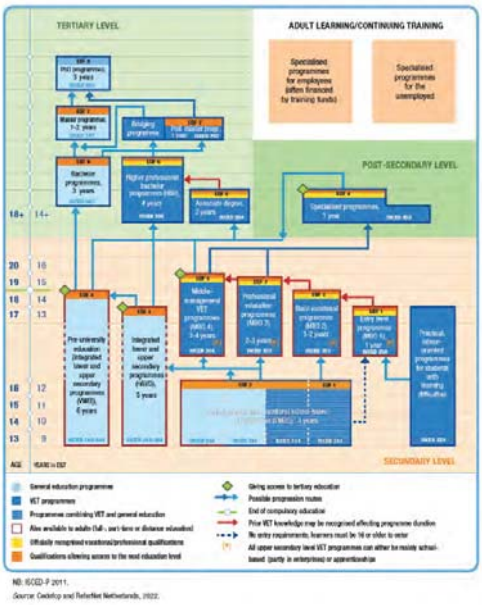
1. Chamber of Commerce and Industry of Slovenia (GZS) – Association of Wood and Furniture Industry
    - Acts as the main representative body for wood-processing and furniture companies in Slovenia.
    - Provides legal, business, and export advisory services to its members.
    - Organizes networking events, training, and promotional activities.
    - Facilitates dialogue between industry and government, particularly with the Directorate for Wood Industry.
    - Plays a key role in policy advocacy, including the establishment of the Directorate itself, which was created following GZS's initiative.
    - Supports internationalization and participation in EU-funded projects and strategic partnerships (e.g., SRIP Smart Buildings and the Wood Chain).
2. Wood Cluster (Lesarski grozd)
    - A collaborative platform that connects wood-processing companies, research institutions, and support organizations.
    - Promotes joint development projects, innovation, and knowledge transfer.
    - Encourages regional cooperation and the development of value chains in the wood sector.
    - Supports companies in applying for funding, improving competitiveness, and adopting sustainable practices.

Together, these organizations provide a strong backbone for sectorial development, ensuring that the voice of the industry is heard in national policymaking and that companies have access to the resources and expertise needed to grow and innovate.

Netherlands

VET System & Governance

The Ministry of Education, Culture, and Science oversees the Netherlands' robust vocational education and training (VET) system, known as the Middelbaar BeroepsOnderwijs (MBO) framework. Approximately 70 Regional Training Centers (ROCs) and specialist schools offer training in four qualification levels (MBO 1-4, corresponding with ISCED 2-4), including those specializing in furniture crafting. Employer participation plays a significant role in governance through the Stichting Samenwerking Beroepsonderwijs Bedrijfsleven (SBB), which collaborates with ROCs and business associations to create and revise occupational standards, assure qualification relevance, and manage apprenticeship placements.



Graphic 1: Vocational education and training system chart (Source: Cedefop and ReferNet Netherlands, 2022)

MBO programmes include both school-based (BOL) and apprenticeship (BBL) tracks. The BOL route contains 20-80% workplace learning, whereas BBL is a fully recognized dual road with at least 60% company-based training, frequently with employer-paid apprentices. This system integrates practical industry interaction into all learning levels and specializations, including furniture, resulting in excellent work-based learning rates (~95%) and strong employability (~92%).

MBO colleges, including ROC Mondriaan, Curio, and regionally specialized specialist institutions, provide furniture-making and woodworking programs at various levels, which are improved by collaboration with industry partners via the SBB network. These centers have control over teaching methods, supporting curriculum innovation while utilizing SBB and sector chambers to assure alignment with labor market demands.

Furniture-related MBO qualifications are outcome-based, modular, and include a general education core (e.g., numeracy, Dutch), basic vocational content, specific “profile modules” for furniture-making, and optional components that allow colleges to adapt to emerging industry needs. Core competences covered in these programs typically include:

- Manual woodworking and joinery techniques
- CNC operation and CAD/CAM design skills
- Use of industrial woodworking machinery
- Surface finishing methods (varnishing, sanding)
- Application of health, safety, and quality standards
- Soft skills: communication, teamwork, and entrepreneurship

Specialist training institutions may also offer advanced modules in creative craftsmanship or bespoke furniture design.

Furniture training is widely available through curricula at the levels 2-4. MBO colleges regularly take part in EU-funded projects such as INT4FURN (2022-2024), which aims to improve entrepreneurial skills and digitization in micro-SMEs, and ALLVIEW (2020-2024), which aims to establish Centres of Vocational Excellence in Circular Economy, Digitalization, and CSR in the furniture sector across the

Netherlands and partner countries. These programs encourage curricular innovation, promote tools like as AR/VR and 3D printing, and emphasize competencies related to sustainability.

A strong quality assurance structure combines internal self-evaluation by ROCs and external inspection. Public-private sector chambers use SBB to regularly update certification standards, allowing for rapid response to technology and labor market shifts. MBO promotes lifelong learning by providing adult education, bridging qualifications, and flexible pathways to HBO (Higher Professional Education) for graduates of Level-4 occupational programs.

Albania

Within a short time, span of only 25 years, Albania has achieved a remarkable transformation, from being the poorest country in Europe to becoming an upper-middle income country. However, the production base is narrow and the competitiveness of the, mainly small, enterprises is still weak, thus limiting the capacity for job creation and increased productivity in general and in the wood processing industry.

The Government of Albania has recognised the need to address the employment issue. Vocational Education and Training (VET) generates the workforce of tomorrow, and, thus, plays a key role in economic growth, employment generation and social stability. In 2014, the National Employment and Skills Strategy (NESS) 2014– 2020 was adopted, considered an important milestone since this was the first time that a national strategy paper had addressed employment promotion and Vocational Skills Development as one entity. Two out of four policy priorities defined in the NESS are dedicated to setting up a quality VET system to meet the demands of the labour market.

Public Vocational Training Centers (PVTC) in Albania offer short-term professional qualifications for adults and young people, with the aim of developing their skills and competencies in various fields in line with the demands of the labor market. 9 from 11 PVTC are offering 4,5 month long (360 hrs/20 hrs week) training courses in "Furniture Production" and 2 PVTC are offering also courses in "Woodworking". No exact figures exist on the number of persons trained in the private training institutions[1].

No.	Public Vocational Training Centre	Training Courses offered	Duration
1	PVTC Tirana 4	Furniture Production	360 hrs/20 hrs week
2	PVTC Korçë	Furniture Production	360 hrs/20 hrs week
3	PVTC Shkodër	Furniture Production	360 hrs/20 hrs week
4	PVTC Elbasan	Furniture Production	360 hrs/20 hrs week
		Woodworking	360 hrs/20 hrs week
5	PVTC Gjirokastër	Furniture Production	360 hrs/20 hrs week
		Woodworking	360 hrs/20 hrs week
6	PVTC Fier	Furniture Production	360 hrs/20 hrs week
7	PVTC Vlorë	Furniture Production	360 hrs/20 hrs week
8	PVTC Northwest Region	Furniture Production	360 hrs/20 hrs week
9	PVTC Durrës	Furniture Production	360 hrs/20 hrs week

Table 3. PVTCs offering training courses related to wood processing and furniture industry

Most I-VET programmes, including "Wood processing" related programs follow a 2+1+1 structure (two-year basic vocational training, one year of specialization and one-year consolidation). Some of the VET programmes (mainly business administration, Information Communication Technology (ICT)

[1] https://financa.gov.al/wp-content/uploads/2022/11/Osnabruck-Declaration_National-Implementation-Plan_Albania51.docx

and **forestry**) apply the 2+2 structure (a basic two-year training followed by a two-year specialization phase). The third option is the 4-year structure, only available in three occupational areas—geodesy, veterinary, elderly care services and in some ICT programmes[2].

Until 2023 there were only 5 public professional schools in Shkoder, Kukes, Tirane, Elbasan, Korçe, offering professional education on "Wood processing". After the reform undertaken by the Ministry of Economy and Finance in 2023 VET programs on "Wood Processing" are offered now only in 3 public professional schools in Tirana, Korça and Shkodra on a 2+2 or 2+1+1 year's structure.

The curricula of the VET programs in the above mentioned public professional schools are public and can be found in Albanian language of the 'Portal of Professional Education' (www,vet.al). The curriculum is not tailored to meet the demands of the labor market in the wood industry; instead, it resembles a general education program suited for intermediate woodworking or furniture technicians. Additionally, one of the laboratories used for the purpose of scholar training at the Technical High Scool 'Karl Gega', Tirana, is out of service due to structural instability following the earthquake that hit Tirana on November 26, 2019.

There are yet no post-secondary professional qualifications Albanian Qualification Framework (AQF) level 5 programs offered in "Wood processing".

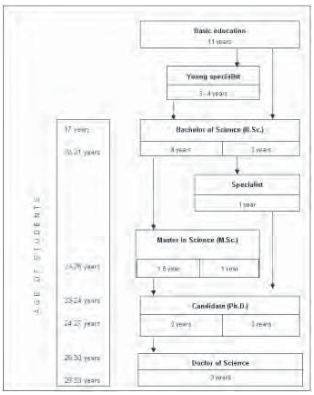
A very small number of those who graduate from the above-mentioned professional schools (2+2 structure), especially in the cities of Tirana and Shkodra, apply to pursue studies or pursue bachelor's studies in the Department of Wood Industry of FoFS. It should be emphasized that this number has been very small over the years and the quality of these streams from professional schools is unsatisfactory.

Montenegro

Strategic framework and responsible institutions

The Ministry of Education and Sports, which supervises national policy, curriculum approval, and educational inspection, established a coordinated, decentralized structure for Montenegro's vocational education and training system. The Centre for Vocational Education and Training (VET Centre), which was established in 2003 by the government, chambers, unions, and the employment agency, presently serves as a technical support and advisory organization for the Ministry. Regional vocational centers, local municipalities, and VET schools work together through sectorial commissions, examination councils, and local VET councils to drive implementation and development. The Chamber of Economy actively engages employers in qualifying standards, curriculum consulting boards, and supporting practical training placements.

[2] UNDP SD4 (2020): Review of Albania's Vocational Education and Training System. Skills development for employment programme. May 2020. https://www.undp.org/albania/publications/review-albanias-vet-system



Graphic 1: Scheme of education system in Montenegro

Since 2015-2020, Montenegro's VET strategy has emphasized the creation of modular programs based on learning goals that are aligned with the Montenegrin Qualifications Framework (MQF). Sectoral commissions have developed 27 occupational standards and ten qualification standards, while ten new modular and credit-rated VET programs were established in 2017-18. In the furniture industry, a specialized pilot project named "We Will Learn to Make Furniture" (IPA II, EU-MNE) focused on carpentry and final wood-processing tasks, including apprenticeships, CNC introduction training, and entrepreneurial courses. These efforts show that sector-specific criteria at MQF levels III-IV include woodworking, finishing, CNC competence, and business orientation.

VET programmes for the furniture sector are designed as modular curricula, combining theoretical knowledge and practical competence aligned to occupational standards. Core modules typically include:

- Woodworking fundamentals (joinery, manual machines)
- CNC basics and CAD/CAM design
- Surface treatment and finishing techniques (varnishing, sanding)
- Quality control and health & safety
- Entrepreneurship and soft skills

These modules are flexible and credit-valued, allowing partial or full qualification-based progression, and supporting lifelong learning.

Initial VET delivery blends classroom instruction with formal work-based learning (WBL) assignments at furniture companies. Schools use legal agreements to gain industry collaborations, and the government gives apprentice stipends in the early years. The "We Will Learn to Make Furniture" pilot program taught 20 unemployed persons carpentry and CNC skills, followed by entrepreneurial support, with the goal of increasing green-economy jobs. Aside from that, 1,295 individuals participated in VET adult learning in 2018, with just a small proportion enrolling in wood/furniture-related programs. The VET Centre's Evaluation Department provides quality oversight and conducts institutional reviews every four years.

The system shows increasing convergence between educational programs and employer needs, but significant gaps persist. Notably, while carpentry, finishing, CNC, and business skills are addressed, sophisticated CNC, digital design tools, ERP systems, and current equipment handling are underrepresented. Additional efforts by the VET Centre, Chamber of Economy, and education

providers are required to deepen sector-specific training, improve teacher competence, and grow apprenticeships throughout Montenegro.

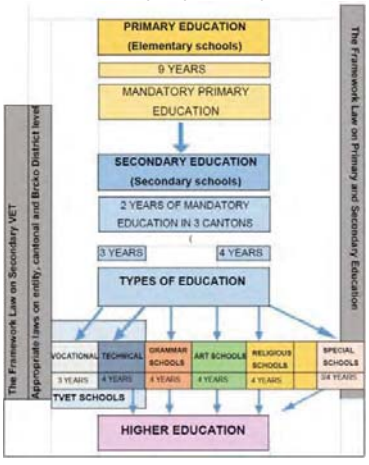
Bosnia and Herzegovina

Vocational framework

The Federal Strategy for the Development of the Wood Industry (2016-2025) in Bosnia and Herzegovina emphasizes the importance of vocational education and training (VET) in increasing the sector's competitiveness and sustainability. Recognizing the ongoing gap between labor market needs and graduate skills, the plan advocates for a fundamental reform of vocational education to fit with modern industrial requirements. The wood processing and furniture sector, which is a significant driver of Bosnia and Herzegovina's export potential, is experiencing a skills shortage, particularly in CNC machine operation, furniture design, carpentry, surface finishing, and quality assurance. To address this, the policy suggests modernizing VET through the implementation of modular, dual-learning models and increased collaboration across schools and SMEs.

At the core of this plan is the implementation of a dual vocational education paradigm, modeled on systems in Germany and Austria. This concept combines academic instruction in vocational schools with hands-on, job-based training in partner enterprises. The goal is to ensure that students learn not only core knowledge but also practical skills that can be applied in the job. Pilot projects based on this concept have been implemented in many cantons, with backing from donor organizations such as GIZ and SDC. In these pilots, schools and businesses sign official agreements outlining the duration and substance of in-company training, with company mentors supervising and evaluating student performance.

The framework of vocational credentials is based on occupational standards created in conjunction with industry stakeholders. These standards serve as the framework for modular curricula, ensuring that learning outcomes are clear and applicable to real-world employment roles in the wood sector. Wood processing technicians, furniture designers, varnishers, and carpenters are among the most common employment profiles.



Graphic 1: Structure of the education system in Bosnia and Herzegovina, governed by specific framework laws (Source: Mapping of VET educational policies and practices for social inclusion and social cohesion in the Western Balkans, Turkey and Israel)

Qualifications are typically aligned with EQF levels 3 and 4 and emphasize a wide range of competencies, including technical and mechanical knowledge, the use of digital tools such as CAD and CNC, and familiarity with health and safety regulations and industry-specific quality standards.

The program covers topics like woodworking techniques, furniture design and construction, surface finishing, CNC operation, CAD design, and quality control. These are supplemented with cross-cutting skills training in entrepreneurship, workplace safety, and teamwork, reflecting the sector's demand for adaptable workers, particularly in small and medium-sized businesses (SMEs). Students also receive experience in environmental and circular economy methods, which are becoming increasingly important in the field of sustainable manufacturing.

The institutional framework for vocational education

Vocational education reform is embedded within a multi-stakeholder governance model, involving:

- Federal and cantonal ministries of education
- Pedagogical institutes
- Chambers of commerce and employer associations
- Vocational schools
- Private sector/enterprise partners

This complex framework ensures close coordination across 14 education authorities, supported through pilot projects and dual-programme implementation. In addition, there are educational institutes established at the Cantonal level in FBiH and one in RS. The main decision makers are the Ministry of Education in RS, the Department for Education in BD, and 10 cantonal ministries in FBiH. The state-wide institutions, the Ministry of Civil Affairs of BiH (sector for education) and the Agency for Pre-primary, Primary and Secondary Education in addition to the Ministry of Education of FBiH have only a coordinating role. For instance, in the case of the breach of the law the Ministry cannot take any legal action. The real decision-making power lies with the 12 education ministries.

Another general point to be born in mind is that all administrative units at entity and canton and levels have insufficient capacity and weak governance structures, since just one or two canton-dependent employees are responsible for the administration of education, including VET (Corradini et. al., 2012). The education system consists of fairly independent units with little coordination as defined by the complex constitutional set-up and multiple layers of government. It requires a degree of coordination that is not currently in place. At the moment, decentralized government structures have been coordinated to a certain degree, by the Conference of Education Ministers, who are supposed to meet twice a year, although this is not sufficient.

The system includes quality assurance measures such as learning result certification, validation of in-company training components, and assessment process standardization. Centers like as Zenica's Center of Excellence for Wood offer authorized testing services (ISO/IEC 17025) to ensure that graduates fulfill both domestic and international standards.

Material sourcing

Slovenia

Wood has always been one of nature's most important raw materials. Forests are the most important source of wood as a raw material. Slovenia is one of the most forested countries in Europe, ranking third in the European Union, behind Sweden and Finland. Forests cover 58% of our homeland (ZGS, 2021). There is 1.067.815 ha of managed forest, 98.828 ha of protective forest and 9.426 ha of forest reserves. The timber stock in Slovenia's forests has been increasing significantly in recent years. The average annual increment for Slovenia as a whole is 7.48 m^3/ha. In 2020, the total potential harvest was just over 7 million m^3, while in the same year 4.2 million m^3 of wood mass was harvested, of which 2,375,840 m^3 were conifers and 1,851,634 m^3 were deciduous. The recorded harvest in 2020 was 59% of the potential harvest according to the forest management plans (ZGS 2021b). Sanitary felling represent 42% of total felling in 2020. Our forests produce 4 m3 of wood per capita per year, but only 0.5 m3 per capita is used for products. Slovenian forest is mostly privately owned (75 %), 21 % is state owned and 4 % is owned by local communities.

Total growing stock is 357 million m^3 or 304 m^3 per ha. In Slovenian forest is 54 % broadleaves and 46 % conifers. The most important tree species are European Beech (32,9 %) and Norway spruce 30,2 %. The portion of other tree species can be observed in figure 1. Slovenian forest is sustainable managed over 250 years (ZGS, 2023).

Harvesting

Harvesting represents the amount of timber actually harvested over a given period of time, expressed in cubic metres per hectare per year. Over the last few years, between 4.0 and 6.3 million cubic metres of trees have been felled annually in Slovenian forests, of which 55% to 66% are conifers. In 2023, a total of 4,300,660 m^3 of trees were harvested in Slovenian forests, of which 2,487,760 m^3 were conifers and 1,812,900 m^3 deciduous (ZGS, 2025).

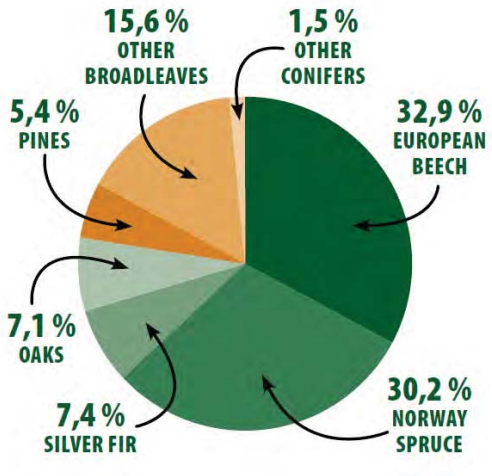


Figure 5: Tree species composition in Slovenian forest (Source: https://www.zgs.si/)

Last available data for harvesting in Slovenia are for year 2023. The production of hardwood forest products in 2023 increased by 10% compared to 2022 and amounted to 2.21 million m^3. The

production of softwood forest products also increased by 6% and amounted to 2.31 million m^3. The largest share in the structure of softwood production was accounted for by sawlogs and veneers with 73%, while the largest share in the structure of hardwood forest products was accounted for by firewood (57%). In terms of forest ownership, private and community forests dominate forest products production with 75%, amounting to 3.39 million m^3 in 2023. Private forests dominate sawlogs and veneer with 47%, followed by firewood with 40%. In state forests, production of sawlogs and veneer dominates with 51%, followed by pulpwood and panel production with 30% (WCM, 2025).

Forest products	2021			2022			2023		
	Conifers	Deciduous	Total	Conifers	Deciduous	Total	Conifers	Deciduous	Total
Logs	1,51	467	**1,977**	1,687	497	**2,184**	1,674	487	**2,161**
Wood for pulp and boards	262	410	**673**	275	451	**725**	332	394	**726**
Other round industrial wood	18	32	**50**	4	44	**48**	16	58	**74**
Firewood	118	997	**1,115**	213	1,019	**1,231**	286	1,267	**1,554**
Total	**1,908**	**1,907**	**3,815**	**2,178**	**2,01**	**4,189**	**2,309**	**2,206**	**4,515**

Table 4: Forest wood products harvested in Slovenia in (1.000 m^3): 2021-2023 (Source: WCM, 2025)

Roundwood exports were in 2021, at 1.367 million m^3 in 2023, a 2% decrease compared to 2022. The structure of roundwood exports in 2023 is dominated by the group of round industrial hardwoods, with beech wood of all dimensions accounting for 39%, or 527,000 m^3. In 2023, the largest volume of forest products (542,000 m^3) was exported to Italy; the structure is dominated by industrial roundwood of hardwoods with 58%, with beech wood of smaller dimensions predominating. Exports to Austria followed, increasing from 368,000 m^3 in 2022 to 462,000 m^3 (+26%). Last year, exports to Austria were dominated by coniferous logs, with 49%, but we have significantly increased our exports of industrial hardwood (+71%), mainly beech, compared to 2022. The third largest importer of roundwood from Slovenia is Croatia, where we increased our exports by 16% last year compared to 2022 and 64% compared to 2021. The largest share of roundwood exported to Croatia (35%) was industrial hardwood roundwood, dominated by beech wood with a diameter of 15 cm or more (WCM, 2025).

In 2023, the balance of export with the forest products shows a surplus, indicating that production exceeds consumption. This amounted to 737,000 m^3, of which 427,000 m3 of the foreign trade surplus with the forest products was in hardwood for industrial processing.

Forest products	2022			2023		
	IMPORT	EXPORT	EXPORT-IMPORT	IMPORT	EXPORT	EXPORT-IMPORT
Roundwood – total, of which:	782	1,388	**606**	630	1,367	**737**
Industrial roundwood – total, of which:	622	1,18	**558**	478	1,167	**689**
– Industrial roundwood, conifers, of which:	507	562	**55**	378	640	**262**
Sawlogs and veneer logs, conifers	239	283	**44**	234	347	**113**
Wood for pulp and boards and other industrial roundwood, conifers	268	278	**10**	145	293	**149**
– Industrial roundwood, deciduous	115	618	**503**	99	527	**427**
Firewood – total	160	209	**48**	152	200	**48**

Table 5: Foreign Trade in Wood Products – Imports, Exports, and Trade Balance (in 1,000 m³); 2022-2023 (Source: WCM, 2025)

Materials used in furniture production

The Slovenian wood industry obtains most of its wood from domestic forests. However, for the production of construction timber used in wood constructions, especially those with the CE mark, we still import. The main importing countries are Austria and Germany. The imports mainly consist of finger-jointed timber (KVH), cross-laminated timber (CLT) panels, and glued laminated timber (BSH). In Slovenia, we do not have any producers of wood panels except for Lesonit, which produces MDF panels. Therefore, we import all composite panels from other European countries. In wooden constructions, OSB panels are mostly used. Meanwhile, in the furniture industry, chipboard and laminated chipboard are predominantly used. Partially, especially for furniture fronts, MDF is also used.

PRODUCT CATEGORY	*VALUE (€)*
4407: wood, longitudinally sawn or cut, split or peeled, planed or not, sanded or not, or longitudinally jointed or not, thickness over 6 mm	170.224.583,00 €
4408: veneer sheets (including those obtained by cutting laminated wood), for plywood or similar laminated wood, and other wood, longitudinally sawn, cut, or peeled, planed or not, sanded or not, finger-jointed or not, longitudinally jointed or not, thickness up to and including 6 mm	26.719.625,00 €
4409: wood (including lamellae and friezes for parquet, unassembled), continuously shaped (with tongue and groove, grooved, chamfered, v-jointed, profiled, shaped, rounded, or similarly processed) along any edge, end, or side, planed or not, sanded or not, or longitudinally jointed or not	17.661.322,00 €
4410: particle boards, oriented strand boards (osb), and similar panels (e.g., wafer boards) from wood and other wood materials, non-aggregated or aggregated with resins or other organic binders	68.446.859,00 €
4411: fiberboards from wood or other wood materials, aggregated or non-aggregated with resins or other organic binders	30.295.086,00 €
4412: plywood panels, veneered panels, and similar laminated wood	62.556.775,00 €
4413: densified (compressed) wood in blocks, panels, strips, or profiles	1.538.177,00 €
4418: joinery and other wooden products for construction, including cellular wooden panels, composite floor covering panels, sawn and split shingles	78.659.051,00 €

Table 3: Import of wood based products and wood composites according to different statistical categories for year 2022

Netherlands

Wood variety

In the Dutch furniture industry, various types of wood are used, each with its unique properties and applications. The most common types of wood include:

<u>Deciduous Wood</u>

Oak Wood: Known for its durability, strength, and attractive grain structure. It is widely used for tables, chairs, cabinets, and flooring.

Beech Wood: A hard and wear-resistant wood with a light, uniform color. It is often applied in chairs, tables, beds, and other furniture that is intensively used daily.

Ash Wood: This light-colored wood has a fine grain structure and is traditionally used for tool handles, but also in modern furniture.

Walnut Wood: Valued for its dark color and beautiful patterns, it is used for luxury furniture pieces.

Coniferous Wood

Pine Wood: A softwood with a light color and visible wood grain. It is often used for rustic furniture and cottage-style decor.

Spruce Wood: Similar to pine, it is used in constructions, floors, furniture, and exterior cladding.

Other Wood Types

Poplar Wood: Found in the Hoeksche Waard region, it is used for various furniture applications.

Alder Wood: Has a beautiful reddish-brown color and is suitable for smaller furniture projects.

Maple Wood: Light in color with a fine texture, it is used for modern furniture and musical instruments.

The choice of a particular wood type depends on factors such as durability, aesthetics, functionality, and budget. Dutch furniture makers appreciate local wood types for their quality and contribution to sustainable production.

Materials used/composites/massive

In addition to traditional wood types, the Dutch furniture industry is increasingly incorporating various materials in their circular economy production. These materials are chosen for their sustainability, recyclability, and ability to be reused or reprocessed at the end of the furniture's life cycle. The focus is on creating furniture that can be easily disassembled, repaired, and remanufactured, supporting the principles of a circular economy.

Recycled plastics: Van de Sant produces design furniture from recycled plastic gathered from land and oceans, contributing to the reduction of plastic waste and deforestation.

Hemp fibers: VepaDrentea has launched a collection of chairs with seat shells made from an innovative biomaterial composed of hemp and resin. This material is renewably-sourced and recyclable.

Bio-based resins: Plantics has developed a 100% organic thermosetting resin made from purely vegetable materials, including residual material from sugar beet. This resin is used as a binder in furniture production.

Eco-friendly fabrics: Some manufacturers use fabrics with the EU Ecolabel or the OEKO-TEX® standard 100 label for upholstery.

PEFC-certified wood: Sustainable wood sourced from responsibly managed forests is used in furniture production.

Recyclable steel: Used in combination with other materials for furniture bases and frames.

Plywood: Some manufacturers, like KILO, use strong plywood coated with 100% natural oil to ensure durability and eco-friendliness

Local market/export oriented

The timber industry in the Netherlands is an important sector that not only contributes to the local economy but also plays a substantial role in global trade. The country acts as a major logistics hub for the trade in timber products, thanks to its strategic location and excellent infrastructure. This report provides an overview of the export and local market of the timber industry in the Netherlands, as well as the main trends and developments in the sector.

Export of wood products

The Netherlands is a prominent player in the export of wood products, with a significant contribution to international trade. In 2021, the value of timber and timber products exports was estimated at around €6.8 billion. This makes the Netherlands one of the largest exporters of wood products in Europe.

Major export products:

- Sawn wood (planks, beams, and other building materials)
- Wood pellets for bioenergy
- Furniture, especially to other European countries
- Wood products for the construction industry, such as wooden facades, floors, and construction materials

Main EU markets for furniture export:

Country	Percentage of Exports (%)	Wood Products Export Value (Million EUR)
Germany	53.7	5000
Belgium	15.3	1200
France	12.8	1000
United Kingdom	10.5	850
Italy	7.7	600

Table 3: Statistical breakdown of the main EU markets for Dutch furniture export

Local market

In addition to export, the wood industry in the Netherlands also has a robust local market driven mainly by demand from the construction sector, the furniture industry and the growing demand for renewable energy.

The demand for wood in the construction sector continues to grow strongly. Wood is increasingly being chosen as a sustainable building material, especially in wooden houses, wooden facades, floors, and roofs. The popularity of wooden structures is also driven by the emphasis on sustainability and energy efficiency in construction.

The Netherlands has a thriving furniture industry, in which wood is an important raw material. Both mass production of furniture and customization are produced and sold locally. This sector remains an important market for wood products.

The demand for biofuels, such as wood pellets and chips, is increasing in the Netherlands, partly due to the growing focus on sustainable energy generation. Wood is increasingly used as a renewable

energy source for heating and electricity. The production of wood pellets is an important activity within this sector.

The focus on sustainability has led to a growth in wood recycling. Companies that focus on reusing old wood are playing an increasingly important role in the circular economy. Recycled wood is processed into new products or used for the production of biofuels, which contributes to making the wood sector more sustainable.

Sustainability initiatives

An important trend within both the local and international market is the emphasis on sustainably produced wood products. There is a growing demand for certified wood, such as FSC (Forest Stewardship Council) and PEFC (Program for the Endorsement of Forest Certification), which comes from sustainably managed forests. This is particularly relevant for exports to markets that have high environmental standards, such as the European Union and the United States.

The Netherlands plays an active role in promoting sustainable forest management and the production of wood products that contribute to the circular economy. This not only promotes the export of sustainable products, also stimulates local demand for greener building materials and renewable energy sources. With an emphasis on sustainability and circular economy, the wood industry in the Netherlands is expected to continue to grow and develop further, both on the local market and on the global stage.

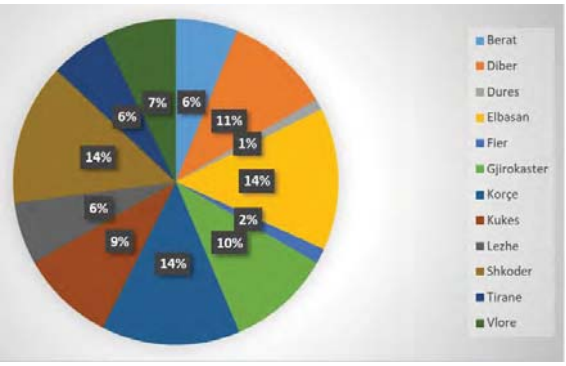
Albania

According to the Forestry Sector Study Report (link), in 2020, 41.6% of the total area of the country (2.87 million hectares) is covered by forests. Coppice is the most adopted form of management, followed by high forests, summer pastures and shrubs.

Region	High forest	Coppice	Shrubs
Berat	17,513.10	33,434.10	22,289.40
Diber	56,784.90	56,784.90	9,021.90
Dures	3,714.90	5,837.70	3,184.20
Elbasan	65,276.10	40,333.20	61,030.50
Fier	4,245.60	8,491.20	4,776.30
Gjirokaster	27,596.40	52,539.30	41,925.30
Korçe	57,315.60	98,179.50	7,429.80
Kukes	26,004.30	67,398.90	16,982.40
Lezhe	23,350.80	28,657.80	21,228.00
Shkoder	67,929.60	81,727.80	15,390.30
Tirane	15,390.30	22,289.40	29,719.20
Vlore	21,758.70	39,802.50	24,942.90
TOTAL	386,880.30	535,476.30	257,920.20

Table 1: Distribution of the forest area according to types (Source: Forestry Sector Study Report)

According to NFI 2020 data the regions with the most significant forest areas are Shkodra, Korce and Elbasan with 14% of all forest areas in the country. They are followed by Diber which own 11% of forest areas, and Gjirokaster. Finally, the provinces with less forest areas are Tirana, and Durres.



Graph 1: Distribution of the forest area according to cities (Source: Forestry Sector Study Report)

The diversity of forest species and the dynamism of forest ecosystems is variable all over the country. Several forest ecosystems are present according to elevation and distance from the sea. Those are mainly dominated by the following forest trees species:

- Beech forests, Fagus sylvatica
- Oak forests
- Mediterranean pines including P. halepensis, P. pinaster, P. pinea, and P. nigra, P. heldreichii, and Abies alba
- Shrub and small tree ecosystems, Arbutus unedo, Erica sp., Carpinus sp., Corylus sp. and Ostrya carpinifolia
- Shrub and small tree ecosystems, Arbutus unedo, Erica sp., Carpinus sp., Corylus sp. and Ostrya carpinifolia
- Mixed hardwood forests, Acer sp, Fraxinus sp

Most of the forest ecosystems in Albania show typical structures for countries in South-East Europe, for which a large amount of deciduous forests are typical.

According to INSTAT, approximately 83 % of the forest consists of semi-natural forests originating from natural regeneration. High forest constitutes 42 %, while coppice accounts for the remaining 56%. Deciduous forests amount to 523.908 ha in total (49.8% of total) of which 57,4% are oak, 37,4% are beech, and with a small percentage of other broadleaf forests such as acacia, poplar, maple and willow.

Coniferous forests make up 14,3 %, of the forests, represented mainly by black pine (62%), Mediterranean pines (wild pine, soft pine), white fir (10 %), and 28 %of other coniferous trees.

Montenegro

Forestry in Montenegro

According to the Official Institution for Statistics in Montenegro (MONSTAT), the forest area in Montenegro is presented in the Table 1.

The analysis will be conducted over a fixed period of observation, spanning from 2017 to 2021. All data and analysis will be conducted within this designated timeframe.

The forestry sector in Montenegro is a matter of considerable importance. Given the country's abundance of natural resources, Montenegro is well positioned to leverage its potential. Montenegro is endowed with a variety of natural resources, including forests.

	TOTAL	*Under forest*	*Other forest land*
2017	827.370	711.538	115.832
2018	827.453	711.610	115.843
2019	827.536	711.681	115.855
2020	827.618	689.923	140.695
2021	827.701	703.546	124.155

Table 1: The forest area in Montenegro – in ha

In order to facilitate the analysis of Monstat, the forest has been divided into three distinct groups: deciduous, coniferous, and other. As illustrated in Table 2, deciduous forests exhibit a significantly higher proportion compared to coniferous forests. A review of the available data reveals a clear increase in forestry over the course of several years. This phenomenon may be attributed, at least in part, to a growing conscience regarding the nation's natural resources.

	TOTAL	*Deciduous forests*	*Coniferous forests*	*Mixed forests*
2017	827.370	587.433	148.926	91.011
2018	827.453	587.492	148.941	91.020
2019	827.536	587.551	148.956	91.029
2020	827.618	595.885	140.695	91.038
2021	827.701	581.874	154.780	91.047

Table 2: Forest area by type of stands

Montenegro has gained international recognition for its seven national parks, which are renowned for their natural beauty and biodiversity. A substantial proportion of these parks is covered by forests. It is for this fundamental reason that Montenegro has established a distinction between economic and protective forests, with the aim of distinguishing the utilization of each forestry area. The wood industry in Montenegro is a primary catalyst for economic growth, contributing significantly to the nation's exports and imports. This industry plays a pivotal role in the Montenegrin economy, underscoring its importance in the broader economic landscape.

	Total	*Economic forests*			*Protection forests*		
		Deciduous forests	*Coniferous forests*	*Mixed forests*	*Deciduous forests*	*Coniferous forests*	*Mixed forests*
2017	827.370	551.029	132.379	89.356	36.404	16.547	1.655
2018	827.453	551.084	132.392	89.365	36.408	16.549	1.655
2019	827.536	551.139	132.406	89.374	36.411	16.551	1.655
2020	827.618	547.883	134.074	91.866	36.415	15.725	1.655
2021	827.701	547.938	114.223	89.392	33.936	40.557	1.655

Table 3: Forest area by purpose

The wood industry in Montenegro

The wood industry has identified several groups of wood and its uses for the purpose of comparative analysis over time.

Industrial wood has favorable physical and chemical properties and is intended for industrial (mechanical and chemical) processing.

Technical wood has favorable physical properties and is intended for various technical purposes. Technical wood includes:

- Mining wood,
- Poles for power and telephone lines,
- Small technical wood,
- Other round wood,
- Stumps and other hewn and split wood.
- Fuel wood is wood intended for heating or for the production of charcoal.

Bosnia and Herzegovina

WOOD VARIETY

Forest Coverage and Types

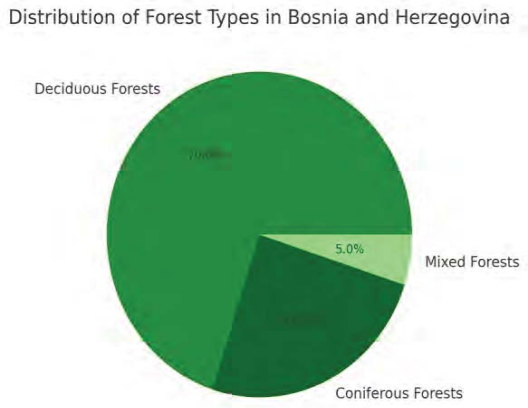
Bosnia and Herzegovina is among the most forested countries in Europe, with approximately 53% of its total land area covered by forests, equating to around 2.7 million hectares. Forests are classified into two primary categories: high forests (natural regeneration) and coppice forests (managed for periodic cutting). The mountainous regions of BiH provide high-quality timber, with slow-growing trees yielding dense, durable wood, suitable for construction and furniture making.

The largest forested areas in BiH are found in:
- Una-Sana, Zenica-Doboj, and Tuzla Cantons (Federation of BiH)
- Banja Luka, Foča, and Višegrad Regions(Republika Srpska)

Dominant Tree Species
- Deciduous forests: Beech (Fagus sylvatica), Oak (Quercus petraea, Quercus robur, Quercus cerris)
- Coniferous forests: Spruce (Picea abies), Fir (Abies alba), Pine (Pinus nigra, Pinus sylvestris, Pinus heldreichii)
- **Mixed hardwood forests:** Maple (Acer sp.), Ash (Fraxinus sp.)

Forest type	Area (ha)	% of Total Forests
Deciduous Forests	1,890,000	70
Coniferous Forests	675,000	25
Mixed Forests	135,000	5

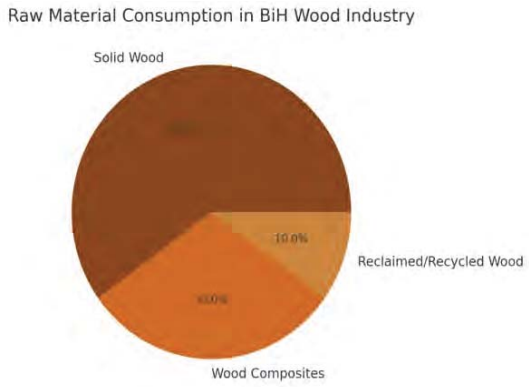
Table 1: Forest Coverage in Bosnia and Herzegovina, Source: Wood Products Report, USDA, 2021



Graphic 1: Distribution of Forest Types in BiH, Source: USDA Wood Products Report, 2021

MATERIALS USED/COMPOSITES/MASSIVE

The wood processing industry in Bosnia and Herzegovina relies on both solid wood and engineered wood products. The main categories of materials used include:
- Solid Wood: High-quality oak, beech, and walnut for premium furniture and construction.
- Wood Composites: Medium-density fiberboard (MDF), chipboard, and plywood, used for cost-effective furniture production.
- Reclaimed and Recycled Wood: Increasingly used in eco-friendly manufacturing.



Graphic 2: Raw Material Consumption in BiH Wood Industry, Source: The Wood Industry of BiH Performance and Export Analysis, 2023

EXPORT PERFORMANCE AND MARKET ORIENTATION

Export Markets

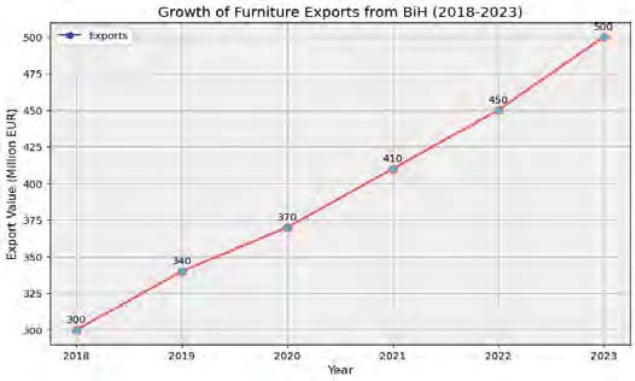
Destination Country	**% of Total Exports**
Germany	35
Austria	20
Italy	15

Croatia	10
Other	20

Table 3: Export Destinations of Wood Products from BiH (2023) (Source: The Wood Industry of BiH Performance and Export Analysis, 2023)

Challenges and Opportunities

- Challenges: High transport costs, limited access to financing, outdated technology.
- Opportunities: Growing demand for sustainable furniture, EU market access, expansion of domestic production.



Graphic 4: Growth of Furniture Exports from BiH (2018-2023) (Source: The Wood Industry of BiH Performance and Export Analysis, 2023)

Production line

Slovenia

In 2023, the Slovenian wood and furniture industry (C16 + C31) faced significant challenges due to high energy prices, inflation, and reduced demand in key export markets like Germany and Austria. Despite these pressures, the sector maintained a positive net profit for the ninth consecutive year, supported by strong investment activity and public funding.

Production Line Overview

The wood industry includes primary processing (sawmilling, veneer, parquet, joinery) and secondary processing (furniture manufacturing).

Business models are increasingly focused on:

- Export orientation: Over half of the revenue comes from foreign markets.
- Value-added production: Emphasis on design, innovation, and sustainable materials.
- Circular economy principles: Efficient use of raw materials, recycling, and energy recovery.
- Digitalization: Gradual adoption of smart manufacturing and digital tools.

In Slovenia, the wood industry consists of approximately 1,454 Self-employed businesses and 1,048 registered companies.

- Self-employed businesses are typically small-scale operations, often with 1 to 2 employees, and rarely more than 10. These businesses are primarily engaged in carpentry, custom furniture production, furniture installation, and small-scale sawmilling, often located on farms.

- Over the past 10 to 15 years, a number of medium-sized furniture companies have emerged. These firms generally employ between 10 and 50 people and specialize in custom-made furniture for known clients. Their operations include design, production, and installation, and they serve both the Slovenian market and neighbouring countries. These companies employ a diverse range of professionals, including designers, technicians, and installers.
- Until the mid-1990s, Slovenia had many large companies in the wood industry that processed timber from logs to finished products. These vertically integrated enterprises included primary processing, drying facilities, semi-finished product manufacturing, and final product production.

However, following Slovenia's independence and the privatization process, most of these large companies collapsed. In their place, smaller, specialized enterprises emerged. Today, Slovenia has only up to five large companies in the wood processing sector. All other businesses in the industry are classified as SMEs (small and medium-sized enterprises). In the furniture manufacturing sector, only one large company remains.

The only large furniture manufacturing company remaining in Slovenia is Alples. It specializes in the production of furniture made from melamine-coated particle boards. Their product range includes kitchens, living room furniture, entryway units, children's rooms, and bedrooms.

Currently, no Slovenian furniture company produces furniture for large international retail chains such as IKEA. The main reason for this is the high labor costs in Slovenia. Although many companies use modern CNC machinery that enables significant optimization of labor and material usage, the cost structure still makes it difficult to compete in mass-market segments.

Technology in Slovenian wood industry companies is steadily improving, supported by various financial incentives, including both grants and repayable funds provided by the Ministry of the Economy, Tourism and Sport, specifically through the Directorate for Woodworking. Slovenia established the Directorate for Woodworking in 2015, with the aim of promoting the development, modernization, and competitiveness of the wood-processing sector.

Technology in Slovenian woodworking companies is continuously advancing, with an increasing number of numerically controlled (CNC) machines being adopted—even by smaller enterprises. However, there are still companies operating with basic, traditional woodworking equipment.

In both the wood processing and furniture manufacturing sectors, the use of industrial robots remains limited. Where robots are used, they are primarily deployed for handling heavy materials, especially for loading and unloading machines. As a result, the wood industry remains a labor-intensive sector, which makes it costly and less competitive in large-scale production compared to countries with lower labor costs.

In Slovenia, there are no domestic manufacturers of machinery or technology for the furniture industry. However, all major European suppliers of woodworking and furniture production technology are present in the Slovenian market. The most commonly used equipment comes from Germany and Italy, known for their high-quality and advanced solutions.

These technologies are distributed through local representatives, who also manage the planning and engineering of new or upgraded production lines. As a result, technological planning is no longer carried out locally. Instead, it is handled by foreign suppliers and their Slovenian agents, who provide

complete engineering services—from initial design and layout to installation and commissioning of the production systems.

In Slovenia, there are no domestic manufacturers of machinery or technology for the furniture industry. However, all major European suppliers of woodworking technology are present in the Slovenian market. Their equipment is sold through local representatives and distributors.

As a result, the planning and engineering of new or upgraded production lines is no longer carried out domestically. Instead, it is handled by representatives in cooperation with foreign technology providers, who deliver complete engineering solutions—from design and layout to installation and commissioning of production systems.

In Slovenia, the wood and furniture industry faces ongoing challenges related to the labor force. While there is a solid base of skilled workers, particularly in traditional woodworking and carpentry, the sector is increasingly experiencing a shortage of specialized profiles. Skills in CNC machine operation, digital production planning, automation, and robotics integration are in high demand but remain limited, especially among smaller companies.

Despite the presence of modern equipment, including advanced German and Italian technologies, many companies struggle to find workers with the technical knowledge required to operate and maintain these systems efficiently. This skills gap is one of the key barriers to increasing productivity and scaling up production. As a result, the industry remains labor-intensive, and its competitiveness is constrained by high labor costs and limited availability of advanced technical expertise.

In terms of sustainability and the circular economy, the Slovenian wood industry workforce is increasingly aware of environmental principles, especially in areas such as material efficiency, waste reduction, and sustainable sourcing. However, practical knowledge and implementation of circular economy strategies—such as product lifecycle design, recycling systems, and eco-certification processes—are still limited among many employees, particularly in smaller companies.

While some progress has been made through training programs and EU-funded projects, there is a growing need for systematic education and upskilling in this area. Strengthening the workforce's understanding of circular business models is essential for aligning the industry with EU Green Deal objectives and improving long-term competitiveness.

Slovenian wood industry companies are increasingly aware of the importance of circular economy principles, and many have already taken positive steps toward more sustainable operations. These include efficient use of raw materials, waste minimization, energy optimization, and the use of certified sustainable wood. Larger companies, in particular, are integrating eco-design and modular product concepts, which support longer product lifecycles and easier recycling.

However, the implementation of circular economy strategies is still uneven, especially among small and medium-sized enterprises (SMEs). Many companies lack systematic approaches to product lifecycle management, material recovery, and closed-loop production systems. Additionally, knowledge and capacity for innovation in circular business models—such as product-as-a-service, reuse platforms, and take-back schemes—remain limited.

To fully embrace circular economy principles, the sector needs:

- Targeted training and education for employees and managers.
- Stronger collaboration with research institutions and technology providers.
- Supportive policy frameworks and incentives from government bodies.

- Digital tools for tracking materials and optimizing resource flows.

With these improvements, Slovenian wood companies could significantly enhance their environmental performance, resilience, and competitiveness in the European market.

Netherlands

The wood processing sector consists of various companies that contribute to the production and processing of wood. The Dutch wood industry is a dynamic sector that plays a vital role in the economy and sustainability by ensuring efficient wood utilization and processing.

Wood sawmills are the first step in the supply chain, cutting raw logs into usable timber for further processing. Wood processing companies refine this timber into finished products like furniture, doors, and construction materials. Timber wholesalers act as intermediaries, distributing wood products to industrial customers. Timber importers bring in raw and processed wood from other countries to meet local demand. Carpentry companies specialize in custom wooden structures for construction projects. Wood energy companies produce biofuels like pellets and wood chips for sustainable energy. Construction companies use wood for building eco-friendly structures. Wood recycling companies repurpose old wood into new products or biofuel, reducing waste. Furniture producers design and manufacture wooden furniture, from standard to high-end pieces. Woodworking machine suppliers provide essential tools and equipment for industrial woodworking. Wood preservation companies treat wood to extend its lifespan and enhance durability.

Advanced CNC & CAD/CAM Systems

Dutch furniture producers frequently use 2-5-axis CNC machining centers—including nested routers and vertical CNCs—from major European providers such as Biesse, SCM, Homag, and Weinig. These systems provide precise cutting, drilling, and routing, allowing for batch production as well as highly customized runs.The implementation of Industry 4.0 ideas, such as integration with IoT, AI-driven toolpath optimization, and digital twins, is speeding up CNC modernization to boost productivity and decrease waste. Engineering and design teams leverage CAD/CAM software to generate production-ready files and CNC programs. The tight CAD-to-machine workflow is widely utilized – a hallmark of Dutch industry practices.

ERP, MES & Smart Factory Integration

ERP systems are rapidly being used to manage inventories, orders, scheduling, procurement, and financial activities. Many manufacturers, including SMEs, are moving toward integrated solutions to boost operational efficiency despite IT infrastructure limits.

The broader Industry 4.0 goal includes connecting ERP-MES-CAD-CNC systems to enable real-time production control, decrease redundancy, and support batch-size-1 manufacturing. While full integration remains rare in the sector, prominent businesses such as Homag and Biesse provide modular "networked cell" solutions that are MES compatible.

Some high-end manufacturers now use automated feeding and unloading systems, robotic arms to load and unload CNCs, and smart storage solutions (such as Biesse's Winstore). These technologies help to alleviate labor shortages and increase throughput. In finishing lines, new spray painting methods, such as those developed by Dürr, are being used to standardize high-quality finishes in larger-scale or environmentally regulated facilities.

Alignment with Worker Preparation

The robust Dutch VET system—through MBO programmes and Centres of Vocational Excellence—already includes CNC operation, CAD/CAM, and basic ERP/MES modules, aligned with industry needs. Apprenticeships (BBL routes) ensure strong on-the-job exposure in modern workshops.
However, as automation deepens, additional digital competencies are required. These include:

- ERP-MES integration
- Data analytics for production optimization
- Use of smart devices, AR maintenance tools (like “Smartech glasses”)
- API-linked factory workflows and digital twin management

Albania

Technologies Applied in Production Lines

It is surprising to see that in the last 15 years, Albanian companies have made substantial investments in technology. The primary focus of these investments lies in computer numerical control (CNC) machinery, used to increase precision and automation in wood production. These cutting-edge machines find application in various processes, including edge banding, panel saws, drilling, engraving, and laser cutting wood panels. This investment in technology goes in parallel with the expansion of production sites, as effective usage of these machines requires bigger spaces and efficient positioning.

Usually, companies buy these machines from Italian, German, Turkish, and Chinese brands like: Biesse, SCM, Orient, Dinçmark. These prestigious international companies also offer the services of putting machines to use, training employees, and maintenance services. The training sessions provided by the selling company are expensive and brief in duration.

Business Models

The sector's business structures are primarily conventional, with a concentration on made-to-order production for domestic demand and little export market access. The most popular service is custom-made furniture for both residential and business clientele. Companies frequently rely on short manufacturing runs, human labor, and rigid design procedures, which stifle both cost effectiveness and innovation. Circular and sustainable business concepts are still in their infancy. Some interesting projects include collaborations with reuse platforms such as Recycling Albania (RA), which gathers and refurbishes discarded furniture. However, these are project-based and regional methods, not industry-wide.

Workforce Preparation and Skills Gaps

The current workforce in Albania's furniture sector lacks digital and technical proficiency. While many workers have great manual skills in carpentry and joinery, there is a severe lack of training in CNC operation, CAD/CAM design, sustainable production practices, and eco-design thinking.

Montenegro

Machinery & Production Technology

Montenegrin furniture producers use a variety of CNC machines, CAD/CAM design tools, edge banders, and beam saws, which are predominantly supplied by European and global technological leaders like as HOMAG, the SCM Group, and Weinig. Companies invest in CNC machining centers for drilling and routing, edge banders for finishing, and precision saws, all to improve production speed and quality. For example, furniture companies' investments in beam saws and edge banders reflect case study trends, albeit specific Montenegrin adopters are not identified.

According to recent polls, the majority of Montenegrin furniture manufacturers have incorporated ERP systems into their everyday operations, which include inventory, finance, manufacturing orders, and logistics. Furthermore, many organizations use PCs, servers, tablets, and rudimentary CNC machines; some even use 3D modeling and design software in their interior design departments. However, the industry lacks new technologies such as industrial robots, IoT sensors, AI tools, and business intelligence systems, and its ERP systems are not fully integrated with machine-level data.

Academic endeavors, particularly those published in the journal Applied Sciences, highlight the use of 3D scanning and reverse engineering techniques in Montenegrin workshops to improve furniture manufacturing, dimensional accuracy, and prototyping. These technologies increase the alignment of physical outputs with CAD designs, a trend fueled by academic-industry collaboration.

Alignment with Worker Training

While Montenegro's VET system includes CNC machine and CAD training, as well as basic finishing and quality modules through the "We Will Learn to Make Furniture" pilot, significant technologies such as ERP operation, 3D scanning, data management, and robotic handling are largely absent from formal curricula. Workers are familiar with CNC and CAD, but they have limited experience with integrated ERP processes, digital prototyping tools, and data-driven quality assurance. This results in a skills gap between vocational training and industry requirements, particularly in areas such as digital production management, machine-to-ERP connectivity, and advanced finishing automation.

Bosnia and Herzegovina

Technology advancements

In recent years, BiH's furniture sector has seen a significant technological revolution, incorporating digital and automated systems into traditional production procedures. Zanat, a century-old furniture maker based in Sarajevo, is a noteworthy example. With the EBRD's Advice for Small Businesses initiative, Zanat implemented enterprise-wide ERP and production-tracking software to maximize workstation capacity and control order progress, increasing efficiency by 20-30% and removing bottlenecks. These technologies, supplied from European vendors through development funding, improve administrative and on-the-floor efficiency by connecting workshops with logistics and finance.

Leading domestic manufacturers are investing in CNC machining centers, 5-axis CNC routers, and CAD/CAM systems. For example, a bed maker in Prijedor uses CAD/CAM design and programming, as well as traditional and CNC machining techniques, followed by wet varnishing. Arting Gradnja in Lukavac uses Biesse Rover 5-axis CNC machines for accurate cutting and shaping, which are supplemented with wood-drying kilns and integrated CAD/CAM workflows. Herceg d.o.o. in Srebrenik employs high-end Swiss and Italian equipment from 2024, including the Weinig Conturex Vario XS, OptiCut S50, Powermat 700, a Biesse Rover A 1632 CNC center, and Finiture robotic paint-spraying lines.

Collaboration between academia and industry is also becoming increasingly important. The University of Sarajevo, in collaboration with local manufacturers, is using 3D scanning and reverse engineering to improve quality control and design workflows. These devices enable digital prototyping, dimensional verification against CAD models, and the restoration of antique furniture.

Alignment with Workforce Preparation

The use of modern technology in production highlights the critical requirement to match workforce capabilities to industrial expectations. While BiH's vocational programs, particularly those funded by the Federal Strategy for Wood Industry Development, include modules on CNC operation, CAD, quality control, and safety, there is still room to improve digital capabilities and synchronize digital manufacturing practices.

CNC training and CAD skills are included in current national requirements, but emergent techniques like as ERP software operation, 3D scanning for quality assurance, and robotic finishing are not generally covered in vocational courses. The Herzegovina industry study indicates no formal application of IoT, AI, or robotics, which aligns with the reality that vocational education has not yet expanded to integrate these new technologies.

Waste management

Slovenia

In Slovenia, waste wood management is regulated by waste management legislation, including the Environmental Protection Act and the Waste Management Regulation. The main goal is to reduce waste generation, increase reuse and recycling, and minimize environmental impact.

It is important to distinguish between wood residues and recycled wood. Wood residues are by-products of wood production, while recycled wood is wood that has gone through at least one use cycle.

Overview of the expected treatments of wood waste streams in 2025 (Source: Waste management program, 2022)

Wood waste: the following treatments are foreseen for waste from wood processing and recycling, particleboard and furniture production:

- preparation for reuse of furniture waste (bulky waste);
- recycling and recovery of waste (for the production of particleboard and fibreboard, as raw material in the pulp and paper industry and in the building materials sector, etc.);
- thermal treatment for energy recovery.

Waste wood is collected separately from other waste types. Households and businesses are required to dispose of waste wood in designated containers or deliver it to collection centers. Companies that generate large amounts of wood waste must keep records, report on waste generation, and ensure proper handling.

The majority of wood waste is made up of sawdust, shavings, chips, wood, particleboard and veneer, which do not contain hazardous substances. Wood waste containing hazardous substances, such as

particleboard waste, treated wood, mixed construction and demolition waste, represents a very small percentage of total wood waste; less than 1% in 2019.

TYPE OF WASTE (T)	2013	2014	2015	2016	2017	2018	2019
BARK AND CORK (03 01 01)	14,200	8,872	9,673	5,760	0	27	0
WASTE BARK AND WOOD (03 03 01)	19,242	20,503	20,988	20,910	32,764	20,170	15,307
SAWDUST, SHAVINGS, WOOD CHIPS, PARTICLEBOARD, AND VENEER NOT CONTAINING HAZARDOUS SUBSTANCES (03 01 05)	177,572	193,723	169,323	77,384	22,010	9,847	11,313
MIXED CONSTRUCTION AND DEMOLITION WASTE (17 09 04)	27,123	33,476	47,181	98,211	251,558	124,664	180,567
WOOD (17 02 01)	4,799	3,464	3,294	2,721	3,304	4,888	6,050
MUNICIPAL WOOD WASTE (20 01 38)	18,884	40,172	8,490	4,339	4,818	3,762	5,900
WASTE WOOD PACKAGING (15 01 03)	415	757	19,146	15,618	19,267	21,534	25,813
TOTAL	**243,467**	**277,706**	**278,095**	**224,943**	**333,721**	**184,892**	**244,950**
WOOD WASTE CONTAINING HAZARDOUS SUBSTANCES (03 01 04, 17 02 04, AND 20 01 37*)*	124	1183	8,372	2789	175	61	2139

Table 4: Types and quantities of wood waste. Data are shown in tons (Source: ARSO, SURS-ODP and KO-Z) (Table from Waste management program. 2022)

Households generated 712,000 tonnes of municipal waste (336 kg per person), an increase of 10% compared to the previous year. The largest increase was recorded in bulky waste (+65%), followed by metallic waste (+22%) and wood waste (+15%), mainly due to the floods that affected Slovenia. The impact was also visible in the regional distribution of waste. In the Savinjska region, municipal waste per person increased by 103 kg (+21%), while in the Koroška region, it rose by 73 kg (+19%).

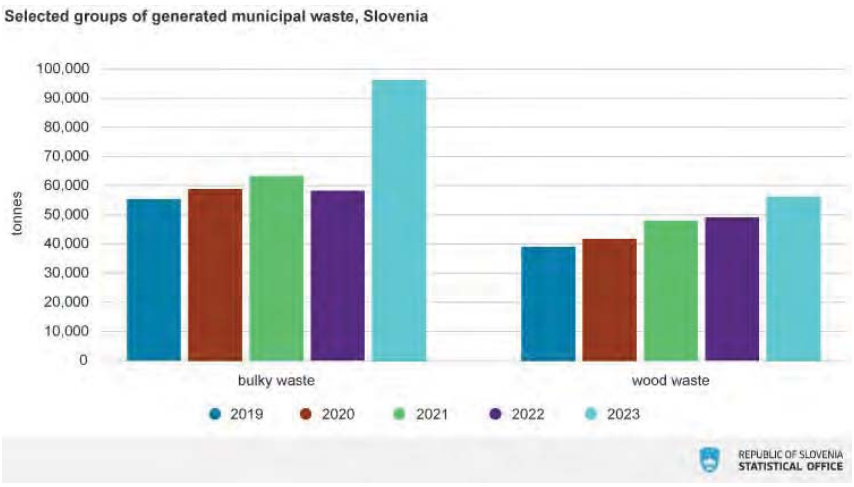


Table 5: Generated municipal waste (Source: https://www.stat.si/StatWeb/en/News/Index/12770)

Treatment of wood waste

Over the past decade, the policy of cascading or stepwise wood use has been established. According to this approach, utilizing wood even after the end of its primary life cycle is crucial. In Slovenia, such wood is referred to as "post-consumer wood." Since wood can be reused multiple times or transformed into new products, it plays a significant role in reducing greenhouse gas emissions and supporting the transition to a green and circular economy.

Main wood waste processing methods include:

- Preparation for reuse
- Recycling
- Composting of untreated natural wood
- Incineration for energy recovery (wood chips, biomass)

Wood waste is primarily directed to the wood-processing industry for the production of particleboard, fiberboard, and paper. Most particleboard is made from roundwood, forest maintenance residues, and wood scraps such as bark, sawdust, and chips. Waste particleboard from production is either reintegrated into the process or used for internal energy generation.

Paper production uses about one-third sawmill residues (chips and edgings), one-third tree crowns and branches, and the remainder roundwood from forest maintenance. Additionally, wood, sawdust, and shavings (without bark) are used for manufacturing wood-cement blocks, ensuring the desired porosity.

Most wood waste used as fuel is thermally processed in woodworking and timber-processing facilities for heating and drying wood. Uncontaminated construction and demolition wood is repurposed for building materials, landscaping, or recycled for energy recovery. Impregnated waste wood, such as poles and railway sleepers, is incinerated, while most hazardous wood waste is sent abroad for incineration. No wood waste landfilled in 2019 and onwards.

The bulky waste is dominated by wooden furniture, which is inspected and, if necessary, repaired and painted and reused for the same purpose, while the remaining bulky waste is transformed into new usable items. Separate waste collection is also necessary for building demolition projects, where wood must be delivered to companies that process used wood or reused for new products.

Good practice of circular economy in furniture industry

One of the most globally aware companies with many sustainability principles in Slovenia is M sora. Company M sora produce high quality wooden windows, and represents a number of companies that manufacture frames and other products for the window and door industry.

Reuse of Wood in the Window Industry

Reclaimed wood, particularly large beams from demolished structures, holds significant potential for reuse in window manufacturing. Companies can process recycled wood into laminated timber for high-quality products, while smaller wood remnants are transformed into composite materials for insulation and structural support.

Producing windows from reclaimed wood involves additional steps, such as sorting, removing nails and coatings, sanding, and bonding. Proper sealing techniques ensure durability, with methods like epoxy filling or oil treatments preventing moisture damage. This process is not yet economically feasible, but as the price of raw materials increases, it will become competitive

Slovenian company M SORA actively segregates wood waste generated during manufacturing and assembly. They collect production scraps, dismantled wooden windows, and packaging materials, repurposing them into new products. Statistical analyses estimate annual Slovenian wood waste at around 100,000 tons, aligning with broader EU figures of 56 million tons in 2018.

Reclaimed wood is increasingly used in architectural and interior design projects, offering rustic aesthetics and sustainability benefits. M SORA integrates repurposed beams and panels into office spaces and exterior installations, promoting reuse in furniture, urban fixtures, and building facades.
M SORA demonstrates circular economy principles at multiple levels, from employee ownership to sustainable material sourcing. Their initiatives include digitalization, process optimization, and eco-friendly supply chain strategies. While significant progress has been made, continuous improvements in resource efficiency and product innovation remain essential for future sustainability (Šubic et al, 2022).

M SORA is actively working on all aspects of waste reduction. Recently, they have introduced a service-oriented innovation aimed at extending the service life of wooden windows. Before the warranty period expires, all windows are inspected free of charge, and any necessary repairs are carried out. Additionally, for a fee, they offer inspections after 10 years of use, providing repairs and restoring damaged coatings. This service helps to extend the durability and service life of wooden windows. This is the first and most important activity in waste management.

In this report, we would also like to highlight the importance of Reuse Centres, where waste is transformed into interesting and useful products. People can donate a variety of items that are still functional and can be repurposed. These centres accept household appliances, furniture, clothing, electronics, books, toys, sports equipment, home accessories, and other reusable products.

Each item is inspected, repaired if necessary, and prepared for reuse. Additionally, a range of remanufactured products is available at these centers at affordable prices, encouraging reuse and reducing waste.

In Slovenia, several Reuse Centers are distributed across the country, supporting sustainability and promoting a circular economy.

Netherlands

Waste management of used furniture in the Netherlands focuses on circular economy principles, emphasizing reuse, refurbishment, and recycling. Here's an overview of the practices and initiatives in place:

Municipal Waste Management

Municipalities, such as Breda, provide free bulky waste collection and drop-off services, including furniture disposal. Items like chairs, sofas, armchairs, and box springs are collected separately and sent to dismantling halls for potential reuse, while fully wooden furniture is categorized as "Wood" waste.

Additionally, recyclable materials like metals (aluminium, iron, and steel) from furniture are collected for recycling. Other large household items, such as carpets, that do not fit in regular waste containers are also included in the collection process.

Circular Economy Initiatives

Government-led programs in the Netherlands promote circular practices in furniture. In 2016, the Dutch government introduced a circular vision for office furniture, influencing the sector. The municipality of Groningen launched "Gronings Goud", a pilot project focused on reusing textiles for office chair refurbishment.

Corporate initiatives also drive sustainability. Companies like Nationale Nederlanden follow a circular furniture strategy, with 70% furniture reuse, 20% second-hand sourcing, and 10% new production using circular principles.

Innovative reuse extends to repurposing old appliances—fridges are transformed into new furniture pieces, such as conference tables.

Regional Circular Procurement

The Flemish government promotes circular procurement through the Agency for Facility Operations (AFFO), which coordinates furniture needs across government entities. A credit system enables entities to exchange surplus furniture, reducing waste and promoting reuse. Nearly New Office Facilities (Nnof) oversees the collection, storage, refurbishment, and redistribution of furniture, ensuring that office resources are efficiently repurposed within the system. Additionally, private waste collection services offer fast furniture pickup, often within 24 hours, across various regions, including Eindhoven, Den Bosch, Roermond, Maastricht, Groningen, and Amsterdam. Additionally, private waste collection services offer fast furniture pickup, often within 24 hours, across various regions, including Eindhoven, Den Bosch, Roermond, Maastricht, Groningen, and Amsterdam.

Circular Design and Manufacturing

Furniture companies are increasingly adopting circular design principles to promote sustainability. Key strategies include:

- Repairing and extending the lifespan of existing furniture
- Using recycled materials in new furniture production
- Designing furniture with detachable components for easier recycling

The Netherlands has made significant progress in circular furniture practices, with efforts spanning government policies and private sector innovations. These initiatives aim to reduce waste, extend furniture lifespans, and promote sustainable resource use in the industry.

Legal framework

In the Netherlands, furniture waste management is a collaborative effort involving national policies, EU regulations, and local initiatives. The Extended Producer Responsibility (EPR) encourages companies to design products that are easy to repair and recycle, promoting sustainability and reducing waste.

As part of the National Waste Management Plan (LAP), the Dutch government outlines strategies to minimize waste and enhance recycling, ensuring efficient use of materials and responsible waste handling.

The Netherlands also follows EU regulations supporting sustainability, such as the Ecodesign for Sustainable Products Regulation (ESPR), which sets standards for repairable and recyclable furniture. The Right to Repair (R2R) allows consumers to extend the life of their furniture, and the European Timber Regulation (EUDR) ensures the use of legally sourced timber, promoting responsible forestry.

At the local level, municipalities implement regulations for bulky waste, encouraging donations to second-hand shops and imposing fines for improper disposal. Voluntary EPR schemes, like those for mattress recycling, also ensure responsible management.

This comprehensive approach fosters a circular economy, reducing waste and valuing resources, positioning the Netherlands as a model for sustainable furniture waste management.

Waste fee and taxation system

As of 2025, the waste fee and taxation system in the Netherlands related to the furniture industry reflects the country's commitment to circular economy principles:

1. Municipalities collect waste disposal levies from households, with rates varying by location and household size. For example, in Delft, single-person households pay €275.96, while multi-person households pay €432.30.
2. The Diftar system, implemented in some municipalities like Uithoorn, combines fixed and variable rates. The fixed rate covers collection and processing of all waste streams except residual waste, while the variable rate is based on residual waste disposal frequency.
3. For businesses, including furniture manufacturers, the Extended Producer Responsibility (EPR) principle applies. Companies producing over 50,000 kg of packaging materials face a Packaging Waste Management Levy, encouraging the use of recyclable materials.
4. The furniture industry is actively participating in circular economy initiatives. In 2021, the Netherlands reported reusing 294,407 tonnes of furniture, demonstrating a significant commitment to recycling and reuse.
5. Innovative services, such as Manutan Group's collection and recycling service for office furniture, are emerging to support businesses in managing furniture waste responsibly.
6. The National Circular Economy Programme 2023-2030 includes specific measures for the furniture sector, aiming to reduce raw material usage and promote high-grade processing of materials.

This system aims to incentivize waste reduction, promote recycling, and encourage circular design practices within the furniture industry, aligning with the Netherlands' goal of achieving a fully circular economy by 2050. The furniture collection and waste treatment system in the Netherlands is designed to encourage reuse, recycling, and waste reduction. This system supports a circular economy by focusing on reuse, repair, recycling, and energy recovery to reduce waste and extend the lifecycle of furniture products.

Collection Coverage

Municipal Services: Dutch municipalities offer free collection services for bulky waste. In Breda, furniture like chairs and sofas are collected separately and sent to dismantling halls for reuse or recycling. Amsterdam provides collection by appointment or drop-off at recycling centers.

Private Services: Companies like Manutan offer specialized collection and recycling services for office furniture, including inventorying, resale, donation, and recycling with full traceability.

Thrift Stores: Organizations like RataPlan provide free pick-up services for reusable furniture, promoting reuse in local communities.

Separate Collection

Material-Specific Sorting: Items like wooden furniture are classified as "Household Wood" and collected separately. Mattresses are collected intact for recycling if their outer layer remains undamaged.

Dismantling Halls: Items unsuitable for resale are dismantled to separate materials like wood, metal, and fabric for recycling or reuse.

Second-Hand Shops (Kringloopwinkels): Usable furniture is donated or collected for resale to extend its life cycle.

Waste Treatment

Reuse and Repair: The government promotes reuse and repair through reverse logistics networks that refurbish and resell discarded furniture. Corporate initiatives like Vrije Universiteit Amsterdam's partnership with Gispen focus on repairing or reupholstering furniture.

Recycling: Materials like wood, metal, and plastics are separated during dismantling and sent to recycling facilities. Companies like Van de Sant use recycled plastics to create fully circular furniture.

Energy Recovery: Non-recyclable components are incinerated to generate electricity and heat.

Challenges

- Composite materials in furniture complicate recycling processes.
- High repair costs remain a barrier to scaling up reuse initiatives.

The Netherlands' approach integrates municipal services, private sector innovation, and circular economy principles to ensure efficient collection, separation, and treatment of furniture waste. These efforts align with the national goal of achieving a fully circular economy by 2050.

Albania

Legal framework

Waste collection and treatment (including used furniture - bulky waste) is by law the obligation of municipalities. The municipalities are responsible for organizing the collection, transport, treatment and disposal services of MSW, and also for building, owning and operating treatment centres and for levying and collecting service fees. Municipalities can choose to provide the service themselves or subcontract the service to private companies (Albanian Environment Agency, 2021).

According to the "Revised Strategic Policy Document on Integrated Waste Management 2020-2035" (link), the role of municipalities in relation to waste management is defined by Law 139/2015 "On Local Self-Government". Municipalities are responsible for the management of municipal waste which is collected by/or on behalf of municipalities and includes:

- Household and similar waste, including:
  o Bulky waste e.g. old furniture,

o Garden waste, leaves, tree cuttings from pruning, waste from cleaning streets and public markets;

- Waste from commercial activities and small businesses, offices and institutions
- Waste from other municipal services such as parks, gardens etc.

The municipalities are responsible for reaching the waste-related targets set by the government and in theory there is a fine if they do not reach set targets, which is set in the waste legislation. Because of the lack of funding, administrative capacity and public awareness, the municipalities have not been reaching their targets and fines have not been implemented in the case of noncompliance. The national government supports the municipalities by creating guidelines for reporting and also economically, by allocating a general budget to the municipalities. In addition, donor organizations, especially GIZ, support municipalities to improve waste management services (Albanian Environment Agency, 2021).

Waste fee and taxation system

In Albania, the service tariffs for waste collection are paid by households and private companies. Municipalities collect the fees, which are approved by the municipality council. For households the fees are based on the number of people in the household, and for businesses the fees are determined by the nature of their activity. A national methodology for cost calculation and tariff setting for municipal waste services was approved in 2019, giving all municipalities the same basis for setting tariffs. Albania plans to improve the tariff system in order to cover the expenses from waste management through the service tariffs. The methodology for cost calculation and tariff setting aims to cover all expenses. The main issue is the implementation of the tariffs, in terms of both approving them in city councils and collecting payment (Albanian Environment Agency, 2021).

Collection coverage

The main system for waste collection in Albania consists of bring points with containers for residual waste collection, where household and commercial waste are collected together. The frequency of collection is once per day in urban areas and two to three times per week in rural areas, with greater frequency during summer and in touristic areas (Albanian Environment Agency, 2021). According to the NWMP, approximately 70 % of the population was served by waste collection services in 2019, mainly in urban areas. This was a slight increase from the previous year, when the coverage was approximately 65-67 %. The collection infrastructure is generally regarded as being in a poor state. Typically, the company collecting waste is also responsible for operating the disposal site (Albanian Environment Agency, 2021). In Albania, the main method of managing waste is disposal to landfill and illegal dumping.

Separate collection

With regard to separate collection, there is no clear economic incentive for the municipalities. It is estimated that approximately **10-18.5 % of municipal waste is collected for recycling**. At the sanitary landfills (Bushati, Maliqi, Bajkaj and Sharra) and the incinerator of Elbasan, staff are employed to pick out the recyclables from the waste streams. In other landfills and dumpsites, there are similar activities performed by the informal sector (Albanian Environment Agency, 2021).

Waste treatment

Many of the landfills in Albania that have been approved for operation by the MoTE do not meet the environmental standards for landfills as defined within EU legislation. It is known that 190 illegal landfills/dumpsites are currently in use as opposed to four sanitary landfills (Bushati, Maliqi, Bajkaj and Sharra). The total capacity of the sanitary landfills is 434 362 tonnes per year. In 2018, an estimated 610 762 tonnes of waste was disposed of in illegal landfills, while 401 755 tonnes of waste was disposed of in legal landfills (Albanian Environment Agency, 2021). Most dumpsites do not have environmental permits, and these sites have been established without the necessary infrastructure to contain landfill leachate and collect landfill gas. All types of wastes are disposed of without prior separation and without a system to manage hazardous wastes, and records of deposits are not kept. Often, the waste at the dumpsite is burned, despite a ban on doing so, creating additional risks to citizens and the environment (Eunomia et al., 2017).

There is now a large potential for recycling, which is not currently being used, and a need to increase separate collection to support the domestic recycling industry. Although private companies deal with a broad range of waste fractions, a significant number deal with scrap metal. Not all of them have an environmental permit from the MoTE (Albanian Environment Agency, 2021).

	Urban waste and Similar		Industrial Waste managed together with urban waste	
Years	Tons	Percentage (%)	Tons	Percentage (%)
2015	1,142,964	81.0	270,269	19.0
2016	1,072,236	83.0	228,137	17.0
2017	1,109,399	88.5	144,514	11.5
2018	1,097,705	82.8	227,366	17.2
2019	945,024	87.0	141,668	13.0
2020	867,522	82.8	180,330	17.2
2021	754,094	86.2	121,011	13.8
2022	725,018	88.4	95,305	11,6
2023	757,325	89,70	86,832	10.30

Table10. *Waste managed by generating origin (2015-2023)*

Years	**Organic**	**Wood**	**Paper Paperbard**	**Glass**	**Plastics**	**Textile**	**Metals**	**Hazardous (non Hospital)**	**Electrical and electrical tools**	**Inerst s**	**Orthers**
2015	51.4	4.6	9.9	4.5	9.6	2.9	4.8	0.5	1.1	8.2	2.5
2016	49.5	5.8	7.9	4.2	10.0	2.8	3.4	0.2	0.8	11.9	3.3
2017	45.9	3.9	9.5	4.8	16.8	3.2	2.7	0.2	2.2	7.4	3.4
2018	61.2	5.1	7.7	3.8	9.2	2.2	1.5	0.2	1.0	5.5	2.6
2019	58.4	2.4	7.6	3.2	9.0	5.6	1.8	0.1	1.4	7.7	2.8
2020	58.5	4.6	7.2	4.3	8.5	3.7	1.6	0.6	0.1	8.9	2.0
2021	58.6	3.7	8.5	4.6	8.7	4.0	2.2	0.2	0.4	6.3	2.7
2022	58.1	3.6	8.9	4.9	9.2	4.5	2.2	0.4	0.3	5.9	1.9
2023	51.4	3.6	9	5.0	9.2	4.5	2.3	0.5	0.3	5.9	2.0

Table 11. *Categories of managed urban waste (2015-2023) in percentage (%)*

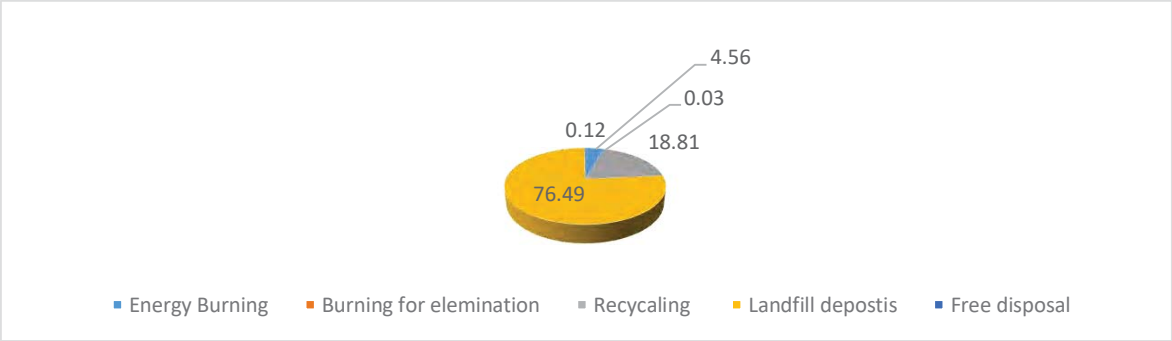


Figure 4. *Urban waste treatment Structure in 2023 in %*

Montenegro

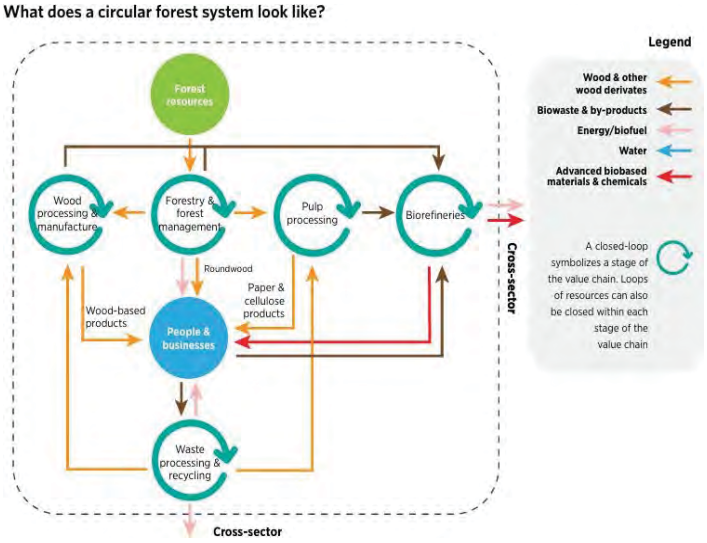
Forestry is considered by Montenegro an important sector in its transition to circular economy. Planned activities refers to sustainable forest management, development of new wood-based products and waste biomass utilization and forestry-linking with tourism and rural development. Some of these measures include:

- the promotion of added value on the use and industry of wood
- measures to improve environmental sustainability
- measures to curb illegal logging etc.

According to the Roadmap towards CE in MNE, the forestry sector has been designated as the priority sector, a decision that was made on the basis of three factors. The first factor was economic importance; the second was the abundance of resources; and the third was the untapped potential of the sector.

The planned activities covered by Roadmap towards CE, are:

- **Sustainable forest management** – reduce illegal logging, concession models for more efficient resource management, improve forest health through better management practices.
- **Development of circular value chains** – biorefineries (transforming waste into bioenergy, biofuels), alternative biomaterials (developing bioplastics, construction materials), waste valorization (more use of wood waste)
- **Integration with other sectors** – ecotourism and rural development.



Graphic 1: The circular system of forestry (Source: The Roadmap towards circular economy in Montenegro – Deloitte and Circular Change)

It has been observed that Montenegro has had legislation norms that refer to waste management for a considerable period of time. However, due to a lack of consistency in implementation, the effectiveness of these regulations has been inadequate. Consequently, there has been a divergence between the national legislation and the EU standards, resulting in noncompliance.

In April of 2024, the MNE governance body established a new law that would come into effect the following year and which would serve to regulate the waste of wood industry. This new law was adopted with the intention of ensuring its strict compliance beginning in 2025. This legislative initiative signifies a substantial advancement by the governance in its pursuit of enhancing circularity.

	2017	***2018***	***2019***	***2020***	***2021***
03 Waste from wood processing and the production of paper, cardboard, pulp, panels, and furniture.	11.032	23.064,4	15.132,7	15.703,7	15.057,7

Table 1: Manufacturing industry – generated waste quantities in tons

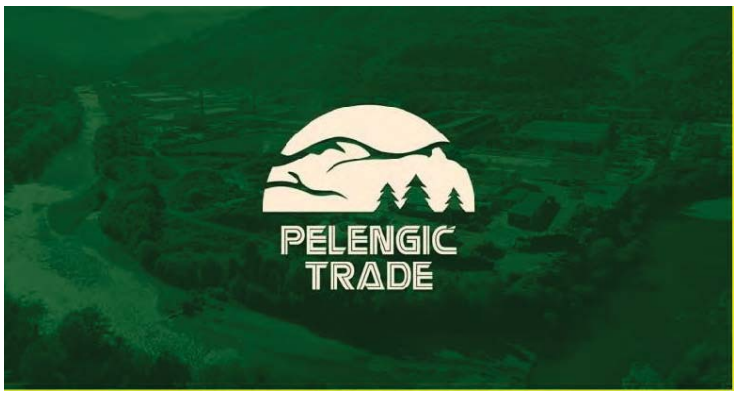
As illustrated in the following table, up to the year 2021, the wood industry and its associated waste were subject to classification. However, as illustrated, these materials were not consistently recycled or exported. As indicated by the data provided by Monstat, the waste was frequently simply disposed of.

03 Waste from wood processing and the production of paper, cardboard, pulp, panels, and furniture.	***2017***	***2018***	***2019***	***2020***	***2021***

Waste processing	2.344	571,7	789,4	445,6	449,8
Recycled	61	-	-	-	-
Waste disposal	480,6	437,5	418,2	-	-
Landfilled	480,6	437,5	418,2	-	-
Export	6.610,5	3.416,1	0,4	-	0,2

Table 2: Processed waste quantities by treatment methods – in tons

The example of a company that implements ESG standards in MNE



Pelenegić DOO Bijelo Polje

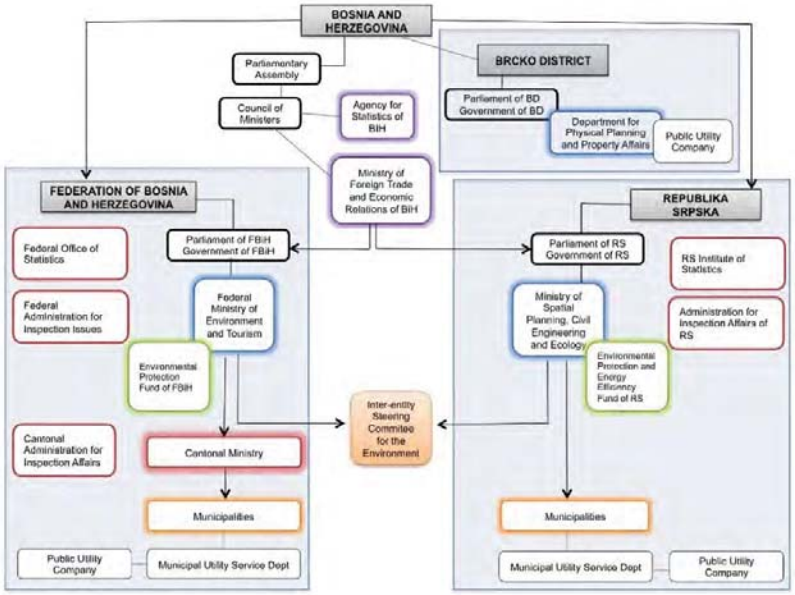
The company "Pelegnić trade" has maintained its dominant position in the woodworking industry of Montenegro for a period of three decades. This achievement can be attributed to the company's team, which is characterized by its expertise and dedication to maintaining the highest standards of quality. Furthermore, the company has invested in modern machinery and the latest technological advancements, which are systematically updated and upgraded on an annual basis. This commitment to excellence has enabled the company to consistently deliver services and products of the highest caliber since its establishment in 1992. The company's production and business facilities are strategically located in Bijelo Polje and Žabljak.

The procurement of pellets for residential or industrial applications can be a challenging endeavor. However, the availability of suitable products is of paramount importance. Pellets are a high-calorific, environmentally clean energy source that produces minimal ash and smoke, resulting in a clean and consistent thermal energy output. The production process entails grinding, proper drying, and pressing of wood. The wood utilized in the production of pellets is of the highest quality, including beech and spruce, which allows for the creation of a biofuel with high energy value. The pellets produced meet or exceed all applicable fuel standards, including those certified by the American Society for Testing and Materials (ASTM). They are engineered to deliver optimal heating performance for pellet stoves, ensuring an efficient and effective energy conversion process.

Bosnia and Herzegovina

Legal Framework

The institutional architecture of municipal solid waste management in Bosnia and Herzegovina is divided over several levels. The institutional set-up is illustrated in Graphic 1 below. Most of the municipal waste in Bosnia and Herzegovina is disposed of in landfills. In 2021, 1.2 million tonnes of the municipal waste collected were landfilled, representing almost 99 % of the total amount that was reported to have been treated. The type of treatment is not reported for about 23 % of the reported amount of municipal waste generated in 2021, and the type is therefore unknown.



Graph1: Institutional set-up of Bosnia and Herzegovina (Source: European Environmental Agency, 2021)

The legal framework is guided by the laws on waste management in each entity:
• the Law on Waste Management in the FBiH (Official Gazette FBiH Nos 33/03 and 72/09);
• the Law on Waste Management in the RS (Official Gazette RS Nos 113/13 and 106/15);
• the Law on Waste Management in the BD (Official Gazette BD Nos 72/09, 25/04, 1/05, 19/07, 2/08 and 9/09).

The laws on waste management promote the principles of waste hierarchy, namely the 'polluter pays' and producer responsibility principles. By-laws concerning specific waste streams, such as for furniture, are currently still missing, and proper implementation and management schemes for extended producer responsibility (EPR) have yet to be developed, guided by successful EU practices.

The FBiH is currently in the process of developing a new environmental protection strategy for the next planning period of 10 years and a new federal waste management plan to replace the one that expired in 2017. Furthermore, in the FBiH, the cantons (10 cantons in total, each with its own ministry) develop their own strategic documents on waste management as part of their legal obligations in accordance with the law on waste management. However, this obligation is not followed up by all municipalities and cantons.

Comparative analysis table

DESK RESEARCH	SI	ND	AL	BH	MN
1 General data					
1.1 Number of enterprises	1454	2900	910	1226	498
1.2 Production value	1,8 billion EUR	€6.2Billion	€244 mil	1,1 billion EUR	~€50 million EUR
1.3 Total employees	11,808	30,000	7495	22,657	2,806
1.4 Total expenses/salary	€1,436.57	€2.158 - €4.889	€ 600-€2000	€900	€800
2 Legal and institutional framework					
2.1 VET presence and functionality	4 secondary schools; 1 higher vocational college; and 1 training center, 1 Faculty department of wood science and technology	Institutions like HMC (Hout- en Meubileringscollege) , ROC Amsterdam, Deltion College, and Fontys offer specialized programs in furniture design, wood technology, and sustainable production.	2 Technical High Schools 1 Faculty of Forest Sciences 11 Public Vocational Training Centers	4 regional Universities (Mechanical Engineering) and 6 high schools oriented to the wood processing and CNC technologies	2 secondary schools; and 1 training center
2.2 National strategic plan applicable for furniture sector analysis	1. Strategic Development and Innovation Partnership SRIP Smart Buildings and the Wood Chain Home; 2. Action plan with measures to develop the wood-processing industry up until 2030	National strategies such as the "Nederland Circulair in 2050" and sectoral analyses by CBM and RVO provide frameworks and funding instruments (e.g. MIA\Vamil, TSE subsidies) for circular innovation and support to the wood and furniture industry.	• National Strategy for Development and Integration (NSDI) 2022–2030 • National Strategy for Employment and Skills (2023–2030) • Forestry Strategy and	1 national and 2 entity strategies regarding wood sector. Financial instruments are organized through entity ministries of economic development - grants for equipment and technologies procurement	Montenegro's Industrial Policy 2024-2028 and the ongoing National Forest Policy highlight wood and furniture processing as priorities.

			Action Plan (2016–2025) • SME Development Strategy (2021–2027) • Circular Economy Roadmap (under development)		
3 Furniture - Material sourcing					
3.1 Solid wood (forestry sector)	Coniferus 1,674 in (1000m3); Decidues 487 in (1000 m3)	The Netherlands has limited domestic forestry resources. Most solid wood is imported, especially from Germany, Sweden, and the Baltic states. Domestic forests (like Staatsbosbeheer) contribute only marginally to the supply and are mainly managed for biodiversity and recreation.		Conifers: 2.123.456 m3; Broadleaf trees: 2.324.346 m3	Deciduous forests: 581.874ha; Coniferous forests: 154.780ha; Mixed forests: 91.047ha
3.2 Wood composites (MDF, partical boards etc.)	Only MDF production	Wood composite materials are widely used in the Dutch furniture industry. Companies often source MDF and	No active MDF production. Industry imports MDF panels.	No active MDF production	No active MDF, OSB or hardboard factory

		particle boards from European manufacturers. Recycled wood content is increasingly common, particularly in sustainable furniture production.			
3.3 Wood import and export (Is it high? Local sourcing?)	Solid wood is mostly local, wood based composites are imported	The Netherlands is one of Europe's largest importers and exporters of wood products. Most raw materials are imported, while value-added products (furniture, panels) are exported. The port of Rotterdam plays a strategic role in international trade flows.	Industry Imports solid wood as in Albania ins not allowed to cut trees. In 2016 the Albanian government announced a general moratorium in forest sector (Law No. 5/2016, February 4, 2016 "For the declaration of the moratorium in the forests in the RoA)	Furniture manufacturers import a significant part of the necessary inputs that are not produced in BiH (plywood, MDF)	Processed wood is imported — especially in composites, panels, and joinery. Exports lean toward raw or minimally processed timber, while high-value processed goods are mostly imported.
4 Furniture - Production line					
4.1 Technology (Is it updated? Suppliers? Are there technology experts?	Imported tech from Germany and Italy. Missing tech experts. 1 MSME for wood constructions	Dutch furniture manufacturers increasingly use CNC machines, CAD/CAM software, robotics, and automated assembly lines.	Albanian companies buy machines from Italy and Turkey. There is a need of technology experts.	Most of the companies are buying machines and tools from Turkey	Furniture production is mostly outdated, with few companies using modern Turkish and Italian

	glulam and sawmills	Innovation in eco-design, modular production, and digital prototyping is also present in leading companies.			equipment, and limited local technology expertise relying mainly on foreign support and training.
4.2 Furniture workforce specialization (skill gaps among workers)	Lack of tech know-how and application; insufficient knowledge of global trends and CE principles	The Netherlands has high innovation capacity in the furniture sector. Institutions like TNO and universities (e.g., TU Delft, WUR) work closely with the industry. There is a strong push for circular innovation, material research, and digitalization.	Facing a lot of difficulties due to lack of qualified workforce. More trainings are needed to fulfill this gap	There is insufficient training among workers in modern manufacturing technologies, contemporary design and product development, and sustainable production practices.	The furniture sector in Montenegro has major skill gaps in CNC, digital design, and finishing, with most workers trained in traditional carpentry and vocational education not meeting industry needs.
4.3 Production line optimization (Is the business model requiring refinement? Can the production be made shorter and more efficient and eco-friendly)	Predominantly SME-based, the furniture industry has room for improvement in tech adoption and CE principles, for example the use of scarce raw	Digitalization in the Dutch furniture sector is advancing through Industry 4.0 tools like CNC-integrated workflows, IoT-enabled machines, MES systems, and automated inventory tracking—widely used by large firms,	Over the past 15 years, Albanian companies in the wood and furniture sector have made significant investments in new technologies. Despite these advancements, many continue to	Many furniture manufacturers in BiH, particularly small and family-owned businesses, rely on traditional, labor-intensive processes with limited integration of modern	Furniture production lines are often inefficient and outdated, with high material waste and low productivity. There is strong potential to improve efficiency and sustainability

	materials and scrap.	with SMEs gradually adopting scalable solutions to boost efficiency and reduce waste.	face challenges in optimizing their production processes. There is a growing need to enhance efficiency and align production with eco-friendly and sustainable economic models.	technologies and automation.	through better planning, automation, and modern production practices.
5 Furniture - Waste management					
5.1 Solid urban waste levels	244,950 Tones	247.000 tones	765.957 tonnes	1.2 million tones	15.057,7 tones
5.2 Circular practices presence (curricula, training courses, training centers etc.)	Only occasional trainings in the context of various projects	Circular practices are increasingly present in Dutch VET education. About 30% of institutions have fully integrated them into their curricula, and 40% offer training in areas like eco-design and wood reuse. However, access to dedicated training centres and equipment remains limited.	There is some interest from the companies in circular economy but still there are no official trainings to be offered. Only occasional trainings in the framework of international projects.	Sustainability and circular economy concepts are gradually being introduced in university and vocational curricula in BiH, but training remains basic, and specialized courses are still limited and mostly offered through international initiatives.	In Montenegro, circular economy practices are emerging through training programs, workshops, and curricula led by institutions like the Science and Technology Park, Zero Waste Montenegro, and the Chamber of Economy's Circular Economy HUB.
5.3 Repair and reuse centers	5 centers	6 active centers and services promoting furniture repair,	4 centers of reuse furniture. Places where used goods	Mostly organized as part of financed EU	Montenegro does not currently have formal "repair & reuse centers" as

		reuse, and refurbishment.	and furniture are sold	projects as a project activity	seen in some EU countries.
5.4 Pellets making (wood recycling)	Producing only wood chips from recycled wood	The NL has two main pellet plants—Energy Pellets Moerdijk and Plospan Bio-Energy—producing around 130 kt/year from sawdust and wood residues, with companies like Plospan offering CO_2-neutral, certified pellets and Martens Wood Waste Solutions converting waste wood into heating fuel.	There are a limited number of companies that are engage in pellet production. They produce pellet from the waste of solid wood and usually export it to the EU market (mainly Italy)	There are 3-4 large pellets making companies with several smaller (10-15)	A well-developed pellet production sector with around 10 active plants, primarily using sawmill waste for export, making it a key component of wood recycling in the country.
5.5 Furniture collection and treatment centers (do you have any)	The same repair and reuse centers mentioned in 5.3	Municipal bulky-waste collection and local recycling centres in Dutch cities like Amsterdam, Utrecht, and Almere offer free or low-fee furniture pick-up, sorting, refurbishment, and recycling through partnerships with charity shops and specialized services, supporting a circular furniture system.	In Albania there are 4 main points of collecting used furniture. There are also small furniture producers they can repair damaged furniture but not in an organized way.	There are none organized as a centers but few wood processing companies have their own collection and treatment centers	Montenegro currently does not have dedicated furniture collection and treatment centers, with existing recycling facilities only handling general waste but not specializing in furniture reuse or refurbishment.

Conclusion

This comparative analysis highlights key differences in the furniture industry between EU partners (Netherlands and Slovenia) and Western Balkan (WB) partners (Albania, Bosnia and Herzegovina, and Montenegro). The analysis, which draws on structured data from each section of the report—from country profiles and sector size to vocational education systems, technological readiness, circular economy (CE) integration, and waste management practices—shows significant gaps in scale, policy maturity, and workforce preparedness.

1. Country Profiles and Economic Data

EU countries show higher industrial scale and output:

- Netherlands and Slovenia report a well-established furniture sector with high production values (€6.2B in NL; €1.8B in SI) and workforce figures (30,000+ in NL; ~11,800 in SI).
- In contrast, WB partners operate on a smaller scale, e.g., BiH employs 22,657 in the sector, but production value is around €1.1B, and Montenegro reports only €50M and 2,806 workers.
- Despite their size, Bosnia and Herzegovina shows strong export orientation (43% of wood sector exports from furniture), while Montenegro and Albania rely mostly on domestic markets and have limited international competitiveness.

2. Legal and Institutional Framework for VET and Circular Economy

- Netherlands and Slovenia have mature VET systems with modern governance (e.g., SBB in NL), modular curricula, and integration of circular economy principles through national strategies like *Nederland Circulair 2050* and *SRIP Smart Buildings and the Wood Chain*.
- WB countries show slower development. BiH and Montenegro have adopted modular and dual VET programs (e.g., "We Will Learn to Make Furniture" in MNE), but gaps remain in alignment with industry needs and circular economy policies are fragmented or project-based.
- Albania relies heavily on donor-funded circular training initiatives and lacks a strategic national CE framework for the furniture sector.

3. Material Sourcing Practices

- Netherlands and Slovenia rely heavily on imported wood composites while supporting circular supply chains. The Netherlands imports MDF and panels but encourages recycled wood content and CE certification.

- WB countries like Montenegro and Albania have no domestic MDF/OSB production and rely on imports, limiting control over sustainability and price fluctuations. Bosnia, with strong forestry capacity, exports raw timber and imports high-value processed goods—indicating low value retention domestically.

4. Production Technologies and Workforce Skills

- EU countries have digitized production lines (CNC, CAD/CAM, 3D design, automation, ERP), supported by strong training systems and industry collaboration (e.g., Dutch MBO programs include AR/VR and modular furniture design).
- WB manufacturers, especially in BiH and Montenegro, still rely heavily on manual, labor-intensive production with only partial use of imported CNC and CAD tools. While Bosnia has some firms adopting 5-axis CNC and ERP (e.g., Zanat, Herceg d.o.o.), most SMEs lack integration, and workforce training is lagging.
- Skill gaps in CE principles, digital manufacturing, and ERP/data management are consistent across WB countries, while EU partners address them through CoVEs and adult upskilling programs.

5. Waste Management and Circular Practices

- The Netherlands leads with comprehensive systems: municipal reuse, refurbishment hubs, and circular public procurement. National strategies and legal instruments (e.g., Extended Producer Responsibility, LAP) support CE enforcement in furniture waste.
- Slovenia has functional reuse centers, pellet production from wood waste, and private initiatives like M SORA promoting full circularity.
- WB countries lag behind:
    - Albania and Montenegro lack formal reuse/repair centers and operate CE training mainly through project-based activities.
    - BiH has a few reuse efforts and chip production, but limited recycling infrastructure. Circular training is scarce and mostly offered via international projects

EU partners have higher levels of industrial output, advanced VET systems, and ingrained sustainability practices, all underpinned by strong legal and institutional frameworks. In contrast, WB partners confront constraints such as low CE policy acceptance, antiquated technologies, and fragmented training provision, with circular practices frequently driven by donor-funded programs. Each theme area of the report—from economic impact and material sourcing to VET systems and CE-related waste strategies—helps to provide a full knowledge of the structural variations that shape the sector in the two regions. This analysis will be the baseline for the capacity building of the project, leading to the preparation of the learning modules of the Training Format (D2.2) and tested for its relevancy during the Training mobility in Ljubljana, Slovenia.

Field research methodology

As part of the SUSFUR VET project, a structured field research process was conducted to collect insights from key stakeholder groups related to the furniture and wood-based industries. The research targeted three distinct cohorts:

1. The business sector operating in or around the furniture industry
2. The VET sector – vocational education and training providers
3. The public sector, with a specific focus on responsible national agencies and reuse centres owned by municipalities

To ensure consistency and comparability across different countries and partners, three tailored questionnaires were jointly developed in English by the project consortium—one for each target group. These questionnaires were then translated into native languages and implemented as online surveys/interviews, which enabled structured, accessible, and secure data collection.

Each version of the questionnaire was designed to reflect the specific roles, challenges, and opportunities of the respective stakeholder group, with an emphasis on circular economy practices, sustainability in training and operations, and the reuse of furniture.

The surveys were distributed separately to each cohort via targeted email invitations sent to carefully selected organizations and institutions. To ensure a sufficient response rate, we issued multiple reminders to encourage participation. In cases where no response was received through the online form, we followed up with selected institutions via phone calls. During these calls, the same set of questions as in the original survey was used, allowing us to collect consistent data and include otherwise missing perspectives.

The responses were subsequently reviewed and analysed using a combination of quantitative frequency analysis and qualitative interpretation of open-ended answers, enabling a holistic understanding of the sustainability landscape within the furniture sector in Slovenia.

This multi-tiered and inclusive approach provided a robust foundation for the project's needs analysis and highlighted actionable opportunities for improving sustainability in VET curricula, public sector practices, and industry collaboration.

Focus group: public sector

Slovenia

Here we summarize the results of field research conducted among public sector institutions, with a focus on their involvement in the furniture value chain, particularly through reuse centres, public procurement, and educational support structures. The data were collected within the framework of the Erasmus+ SUSFUR VET project, which promotes sustainable and circular economy practices in the furniture sector by engaging key actors across education, industry, and public administration.

The public sector plays a multifaceted role — not only as a major consumer of furniture but also as an enabler of reuse infrastructure, policy-maker, and educator.

1. Roles in the Furniture Sector

Respondents indicated their organizations are involved in a variety of ways:

- Development of educational programs
- End users of furniture within public infrastructure
- Preparation of furniture for reuse and upcycling
- Regulatory functions or general involvement in sustainability
- Some did not specify their role

This diversity underscores the need for tailored engagement strategies across policy, operations, and education.

2. Existing Programs and Policies

80% of respondents stated their institutions are implementing policies or initiatives related to furniture sustainability. These include:

- Integration of key sustainability competencies into educational programs — including circular economy, digital literacy, entrepreneurship, and wellbeing
- National-level reuse initiatives, such as the *Centers for Reuse of Slovenia (CPU)*, which partner with municipalities, utilities, and collection centers to collect, inspect, refurbish, and redistribute used furniture

However, some respondents noted a lack of structured programs, reflecting uneven implementation across regions.

3. End-of-Life Furniture Management

Public institutions described the following practices:

- Acquiring discarded furniture through donations or symbolic purchases
- Engaging in reuse and upcycling as an alternative to disposal

These strategies support circular material flows but depend heavily on local initiatives rather than systemic frameworks.

4. Key Challenges

Major challenges faced by public sector institutions include:

- The need to better integrate sustainability competencies into teacher training and student learning

- The financial viability of preparing furniture for reuse, especially in the absence of structural support

These challenges align with those expressed by education providers and business actors, indicating a shared need for coordinated solutions.

5. Stakeholder Collaboration

Respondents reported collaborative efforts with:

- End users (citizens), public institutions, and various stakeholders based on project needs
- Chambers of commerce and employers in the development of occupational standards and training programs

These relationships help bridge policy, education, and industry, and could be further expanded through EU-level support.

6. Sustainability in Public Procurement

Public sector respondents demonstrated strong commitments to sustainable procurement:

- Adoption of a 100% reuse concept, using only existing furniture rather than purchasing new items
- Serving as role models by integrating sustainability values into teacher training and public communication

This shows that some public institutions are leading by example, although broader adoption remains limited.

7. Incentives and Support Mechanisms

The availability of support for reuse and recycling was mixed:

- One respondent mentioned no dedicated support, especially for established social enterprises that often fall outside eligibility for current programs
- Others pointed to Reuse Centers as functional but under-supported mechanisms for implementing circular economy principles

8. Desired Improvements

Public sector actors emphasized the need for:

- Comprehensive improvements across the system: new policies, stronger infrastructure, increased funding, and better partnerships
- Introduction of an Extended Producer Responsibility (EPR) scheme for furniture to ensure life-cycle accountability

These suggestions call for systemic reform to enable long-term sustainability outcomes.

9. Regulatory Gaps

One key regulatory issue was raised:

- The lack of legal status for refurbished or reused furniture within existing waste legislation
    - As a result, all discarded furniture is automatically considered waste, making reuse administratively difficult and financially burdensome
    - There is also an absence of incentives to include reused furniture in public tenders

Another respondent indicated limited awareness of relevant legislation, suggesting a need for broader legal education and policy communication.

10. Willingness to Participate in Pilot Programs
Respondents were cautiously optimistic:

- 50% stated clear interest in participating in pilot programs focused on sustainable furniture practices

This indicates a window of opportunity for engagement — particularly if pilot initiatives offer technical support, visibility, or financial facilitation.

Netherlands

A total of 10 government entities and organizations participated in the focus group, including Gemeente Amsterdam, RVO, and TNO. The surveys were conducted in English and distributed via email, direct calls, LinkedIn outreach, and Google Forms. A mix of open and multiple-choice questions was used to gather both qualitative and quantitative data. Results were categorized and analysed using descriptive statistics and content coding.

1. Focus group discussions revealed that municipalities such as Amsterdam and Rotterdam are directly involved in public procurement processes, whereas national agencies such as RVO (Netherlands Enterprise Agency) and TNO focus on more strategic functions such as policy development, circular initiative funding, and innovation ecosystem coordination. A frequent issue among responders was the incorporation of circular economy aims into municipal initiatives, with a focus on establishing connections between design, procurement, and reuse infrastructure.
2. Approximately 70% of participating institutions reported the presence of particular sustainability-related policies in their operational frameworks. These include circular procurement standards, furniture reuse pilot programs, and green tendering methods. Notably, cities such as Amsterdam have included lifecycle thinking into procurement, requiring vendors to meet criteria such as modularity, reparability, and minimal carbon footprint. However, policy maturity varies—while leading cities employ integrated plans, smaller municipalities frequently use project-based initiatives with limited continuity or scale.
3. Approximately 60% of public sector actors reported using reuse and donation techniques as alternatives to disposal. Common techniques include donating surplus furniture to schools or NGOs, reassigning assets internally among departments, and collaborating with recycling companies. Despite these efforts, many institutions noted the lack of centralized inventory systems to track furniture assets, limiting the systematic implementation of reuse solutions. This leads in fragmented efforts that rely mainly on motivated individuals or ad hoc decisions rather than defined methods.
4. The focus group revealed various structural and procedural impediments. The most often reported difficulty (by 40% of respondents) was that existing procurement standards do not fit with circular aims, often prioritizing cost and compliance over environmental effect or lifecycle value. Budget limits were another commonly reported issue (30%), restricting institutions' ability to choose higher-cost, sustainable alternatives. Furthermore, market constraints—particularly a scarcity of vendors selling circular-certified furniture at affordable prices—were viewed as a

barrier to implementation. Technical obstacles, such as the lack of traceability tools for recycled materials and the absence of design guidelines for modular furniture, were also mentioned.

5. Collaboration was found to be rather restricted, with just 40% of participants reporting that they are now involved in cross-sector relationships. When collaboration does occur, it is usually informal or project-based, with initiatives like pilot programs, local innovation hubs, or education-related campaigns. One major takeaway was the expressed desire to develop such cooperation, particularly with VET providers and circular furniture SMEs. Institutions viewed these collaborations as vital to bridging capacity shortages, changing procurement methods, and promoting long-term systemic change.
6. Half of the participants identified sustainability as a strategic goal, and a growing number of towns are including circularity into their procurement policy. However, a discrepancy was found between policy aim and practical implementation. Some institutions have implemented internal sustainability frameworks, but acknowledged that procurement teams frequently lacked the necessary tools, mandates, and training to properly implement these frameworks. Circularity standards (such as modularity and reparability) are not always enforced, and evaluation procedures are inadequate.
7. Only a small percentage of respondents mentioned institutional incentives, such as take-back agreements or in-house repair services. However, 75% of respondents said they were either ignorant of national-level support programs or assumed none existed. This lack of visibility and access to coordinated support mechanisms causes a mismatch between national circular economy goals and their practical implementation at the municipal or corporate level.
8. Participants' suggestions included: Mandatory circular procurement targets at the national or European level; financial incentives and innovation rewards for experimental ventures; increased investment in reuse infrastructure (such as municipal reuse centers); improved market access for certified circular suppliers; and knowledge-sharing systems that promote the exchange of best practices across municipalities.
9. Respondents identified several critical policy gaps, including: inflexible procurement policies that do not prioritize or reward circularity; lack of established design and traceability criteria for circular products; insufficient monitoring mechanisms to evaluate the cyclical impact of purchases; and weak alignment between national strategies and local implementation capacity. Participants stressed the importance of simple procurement templates, updated procedures, and capacity-building activities for procurement professionals.
10. Institutions expressed specific interest in: pilots that investigate new evaluation frameworks for circularity; creation of community reuse centers; material innovation labs that design and test recyclable materials; and participatory training programs for personnel and facility managers. These pilots were viewed as critical steps towards integrating circular practices into institutional routines and shaping future policy formulation.

Albania

General Information

A total of 8 participants took part in the public sector focus group.

1. The focus group had representation from the following institutions:

- 1 representative from the Ministry of Tourism and Environment (MoTE) which is responsible for environmental regulations and circular economy policies;
- 1 representative from the National Environmental Agency (NEA) – "Agjencia Kombëtare e Mjedisit (AKM)" which is responsible for the environmental impact assessment, licensing and inspection of compliance with legal requirements and environmental conditions;
- 1 representative from Recycling Albania (RA) which is a private-public operator in the recycling chain of bulky waste like furniture;
- 5 representatives from municipal authorities in Tirana, Durres, Lezha, Shkoder and Vlora that are responsible for public procurement and initiating recycling/reuse programs.

2. The institutions represented in the focus group currently have varying degrees of involvement in policies and initiatives affecting the furniture sector, particularly in the context of sustainability and circular economy principles.

MoTE is advancing the national strategy on circular economy through the OECD-assisted "A Roadmap towards Circular Economy of Albania". This roadmap includes broad objectives to reduce waste and promote the reuse and recycling of materials, including furniture and bulky waste. Though not furniture-specific, these policies establish the regulatory framework for sustainable material flows.

NEA implements environmental inspections and licensing requirements, including those related to the disposal and recycling of end-of-life furniture. This is done based on national policies such as:

- Law no. 10431 dated 09.06.2011 "On Environmental Protection" (as amended).
- Law no. 10448 dated 14.07.2011 "On Environmental Permits".
- Law no. 10463 dated 22.09.2011 "On integrated waste management" (as amended)
- DCM No. 402, dated 30.06.2021 "On the approval of the Albanian waste classification catalog"
- DCM no. 686 dated 29.07.2015 "On the approval of the rules, responsibilities and deadlines for the development of the environmental impact assessment procedure (EIA) and the procedure for the transfer of the environmental declaration decision"
- DCM no. 1189, dated 18.11.2009 "On the rules and procedures for the drafting and implementation of the national environmental monitoring program".

RA has initiated targeted programs for the collection and recycling of bulky household and office items, including furniture. These efforts often operate through local partnerships with municipalities and pilot projects aimed at increasing reuse and material recovery.

Municipalities manage public procurement processes and oversee waste management services at the local level. Some have begun integrating sustainability clauses into public procurement contracts (e.g., favoring longer-lasting or recyclable furniture), while others are piloting community-based reuse programs for discarded municipal furniture, particularly from schools and administrative buildings.

Initiatives include: EU for Circular Economy and Livable Cities project; "Let's Go Circular" project (Tirana) etc.

3. The majority of respondents note that while some examples of reuse and recycling exist, most end-of-life furniture is still treated as waste rather than a resource.

MoTE supports the development of national waste management strategies and encourages the inclusion of reuse and recycling in local waste plans but does not directly manage furniture disposal.

NEA oversees compliance with environmental regulations related to waste management but does not directly handle physical furniture disposal. Their role is regulatory, ensuring that disposal practices adhere to environmental standards.

RA works in cooperation with municipalities to process bulky waste including furniture. Their operations include the disassembly of furniture into recyclable components (wood, metal, plastic) and managing the appropriate recycling streams. They also explore pilot schemes for furniture reuse and repair, although the scale remains modest.

Municipalities typically manage end-of-life furniture through their municipal waste collection systems. In most cases, bulky waste, including old furniture, is collected separately or upon request, then transported to landfills or recycling facilities. Some municipalities, such as Tirana and Durres, have piloted initiatives to separate and reuse furniture from public buildings (e.g., schools or administrative offices), redirecting it for donation to community institutions or refurbishing it for continued use.

4. Focus group attendees addressed the main challenges faced by public institutions in Albania in relation to the furniture sector, including:

- There are lacking regulations for the reuse, refurbishment, or recycling in the furniture sector. This regulatory gap creates uncertainty and limits coordinated action among municipalities and agencies.
- Most municipalities lack dedicated facilities or services for the collection, sorting, and processing of end-of-life furniture. Existing waste management systems prioritize disposal over material recovery, and furniture is often treated as bulky waste destined for landfill.
- There is low awareness of the environmental benefits and economic opportunities linked to circular furniture practices. This makes it difficult to build support for reuse programs or community-based initiatives.
- Municipalities and public institutions are often restricted by budgetary limitations that make it challenging to prioritize higher-cost sustainable furniture options or invest in refurbishment schemes. Furthermore, public procurement procedures rarely include environmental criteria or circular economy principles in tendering processes.
- While some ad hoc partnerships exist (e.g., between municipalities and Recycling Albania), there is no structured collaboration mechanism between public agencies, waste operators, and social enterprises that could support systemic change in furniture management.

5. Despite wide variations in the type, scope, and consistency of these partnerships, all of the focus group's participating institutions reported working in some capacity with other public or private actors in the

furniture value chain; these partnerships are typically project-based, locally driven, or take place within the larger context of waste management and circular economy initiatives.

In order to create and carry out national circular economy policies, MoTE mainly works with international development partners like the OECD, EU, and German Cooperation (GIZ). Through these collaborations, MoTE funds pilot projects and capacity-building initiatives pertaining to circular business models, waste reduction, and reuse—all of which may involve furniture but are not specifically tied to it. Additionally, through its involvement in waste management and policy harmonization with EU directives, MoTE works with other ministries and municipal governments to ensure that national environmental policies are implemented locally.

NEA's partnerships are centered on monitoring and regulatory compliance. In order to guarantee that garbage collection, disposal, and recycling—including bulky waste like furniture—comply with national regulations and environmental impact assessment protocols, it collaborates with municipalities, licensed waste operators, and other environmental organizations. Although it is not directly involved in furniture-related operations, NEA works with organizations that are piloting material recovery or eco-industrial initiatives to conduct environmental assessments for reuse/recycling facilities and offers technical assistance.

One of the most active instances of public-private cooperation in the field of circular furniture is RA. To collect, disassemble, repair, and resell secondhand furniture from homes, workplaces, and schools, it maintains agreements with municipalities, especially in Tirana, Durrës, and Fushë-Krujë. In order to provide instruction and internships in furniture repair, upcycling, and sustainable design, RA works with academic institutions and technical schools. Through its World of Values and Circular Marketplace programs, RA frequently collaborates with regional companies and craftspeople to encourage the use of repurposed furniture components and recycled wood. Moreover, RA takes part in EU-funded initiatives that emphasize circular innovation and the creation of jobs via reuse.

Municipalities collaborate primarily with:

- Waste collection and recycling contractors, including RA and other private operators, for bulky waste handling.
- Local NGOs and donor-funded projects to pilot community-level reuse and repair programs.
- Public schools and administrative departments to identify reusable furniture and coordinate donation or refurbishment schemes.

6. MoTE is the lead agency for implementing the Integrated Waste Management (2020–2035). Although no formal and dedicated national policies target furniture reuse and repair, the institution encourages initiatives and efforts to reduce landfilling of biodegradable waste (processed wood included as biomass) to 35% of the biodegradable municipal solid waste generated in 2016. This includes furniture industry waste.

RA as a Circular Economy Park applies sustainable approaches through 3 key hubs:

- The eco-education center is a space for trainings, workshops, retreats, business fairs, and career sessions related to sustainability. More specifically, the center transfers knowledge and best practices related to furniture design and utilization of reuse/recycled wood materials.
- Circular marketplace provides a space for sustainable local products (up-cycled items and second hand goods). Such space is relevant for furniture items also.

- Recycling hall which is more connected to separating materials like wood, metal, and fabric, then processing them into new products or materials. Repair cafes implemented by RA included repairing, cleaning, and upgrading existing furniture.

Municipalities have growing awareness of the benefits of sustainable furniture management, but practices remain inconsistent and pilot-based. Tirana municipality is incorporating green terms into procurement contracts, favoring durable, recyclable, or locally produced furniture. Others have started trial reuse initiatives in schools and administrative buildings, redistributing unwanted furniture to community organizations or renovating it for internal use. However, the general practical overview continues to regard furniture as bulky waste, without the necessary infrastructure, resources, and standards for sustainable management.

7. While Albania is actively attempting to improve its total waste management system, there is no unique, well-established structure of incentives or support mechanisms aimed specifically at furniture reuse, refurbishment, or recycling. Various broader policy efforts and EU-funded projects have created an enabling climate for circular activities in the furniture sector.

Representatives from MoTE and municipalities referred to the EU and German-funded circular economy initiative, which is being implemented in 15 municipalities across the country. This project promotes the creation of material recovery facilities through processing and repurposing. While primarily intended for general waste infrastructure, it serves as a solid platform for circular business models, such as those involving furniture and household products.

Participants discussed the EU-France Waste Infrastructure Programme, which operates in cities including Kukës, Gjirokastër, and Vlora. These projects seek to improve local sorting centers and promote recycling in accordance with EU directives, so indirectly helping efforts to repair and reuse bulky objects such as furnishings.

The focus group discussed RA example as a support mechanism at Fushë-Krujë. This private project combines a recycling yard, an educational facility, and a second-hand marketplace known as World of Values. These facilities actively promote the reuse and restoration of objects, including furniture, and participants saw them as a replicable model that might be integrated into future municipal or public-private partnerships.

Finally from a policy perspective, attendees discussed the ongoing development of Extended Producer Responsibility (EPR) legislation. However, these efforts are more general in scope and haven't specifically targeted the furniture sector.

8.
Focus group participants identified many priority areas for development in the public sector's involvem ent regarding the furniture business, especially in the context of sustainability and circular practices:

- Participants stressed the need for clear national policies that directly address furniture reuse, repair, and recycling. Currently, the lack of a dedicated regulatory framework makes it difficult to coordinate actions across institutions and to build long-term programs.

- There is a demand for dedicated infrastructure such as material recovery facilities, refurbishment centers, and furniture disassembly stations, especially at the municipal level. This would allow better sorting, reuse, and recycling of bulky items.
- Public institutions, especially municipalities, pointed out targeted funding mechanisms to support circular initiatives, procurement of sustainable furniture, and development of public-private partnerships. Incentives for social enterprises and reuse centers were also suggested.
- Municipal staff and decision-makers need training on circular economy practices in the furniture sector. Additionally, public awareness initiatives could encourage citizens and institutions to participate in reuse and donation programs.
- There is a need for systematic cooperation among public institutions, waste operators, civil society, and private sector actors. Structured platforms or working groups could improve coordination and innovation in circular furniture management.

9. Focus group participants based the discussion upon the three main legislation frameworks in Albania:
- Law no. 10463, dated 22.09.2011 "On Integrated Waste Management" (amended) which promotes a hierarchy of waste management, but it does not include specific obligations or targets for bulky waste like furniture.
- Law no. 10431, dated 09.06.2011 "On Environmental Protection" (amended) which establishes principles of sustainable development and environmental protection, but does not translate these principles into actions regarding furniture end-of-life management.
- Decision of the Council of Ministers (DCM) no. 402, dated 30.06.2021 which approves the Albanian waste classification catalog, but does not outline any reuse or recovery strategies for these materials.
- Finally, the EPR scheme does not prioritize furniture on the on-going stage. This means producers and importers are not held accountable for the post-consumer phase of furniture items, which would otherwise incentivize take-back systems or design for longevity.

10. All participating institutions expressed interest and willingness to join in pilot projects aimed at promoting sustainable furniture practices, especially if such initiatives match with broader aims of waste reduction, circular economy development, and capacity building of their staff.
Their involvement conditions include:
- Clearly defined roles and duties for the participating institutions.
- Technical assistance or direction, particularly for local governments with no prior furniture recovery system experience.
- The piloting municipalities want the methodology of the project to be expanded upon or applied to different sectors or localities.
- Additional communication campaigns and training programmes in the future for good practices and access-to-finance possibilities.

Montenegro

As part of the SUSFUR VET project, a survey was distributed to public sector institutions in Montenegro to explore their roles, practices, and perspectives related to the furniture and wood-based industries,

particularly in relation to sustainability and circular economy principles. A total of 10 institutions responded to the survey, offering a snapshot of the current state of public sector engagement in this field.

When asked about their institution's role in the furniture sector, responses highlighted activities ranging from investment promotion to policy development and public procurement. Some institutions are directly involved in strategic initiatives, such as the "Development Program for Wood Processing and Furniture Production 2025–2028", while others focus on operational aspects like tendering for office furniture. Only 40% of respondents reported active engagement in specific programs or policies related to the furniture sector, including sustainability or circular economy initiatives.

In terms of current practices, the management of furniture at the end of its lifecycle varied. The most commonly reported method was recycling (40%), followed by donation programs (20%), partnerships with reuse organizations (20%), and simple disposal (20%). However, 20% of institutions indicated they had not encountered the need to address furniture end-of-life scenarios, suggesting limited experience in this area.

When asked about sustainability principles applied in procurement and furniture management, 60% of respondents stated they implemented ecological design standards, 40% used recycled materials, and another 40% had policies supporting repair and reuse. This indicates a growing, though still uneven, awareness of sustainable procurement practices in the public sector.

Challenges facing these institutions were also explored. The most commonly cited issue was a lack of regulation (40%), followed by waste management problems (20%), supply chain disruptions (20%), and general sustainability challenges (20%). These responses suggest that regulatory and infrastructural barriers continue to hinder progress toward more circular practices.

Regarding collaboration, only 40% of respondents confirmed working with other stakeholders—such as producers, investors, or policymakers—while 60% indicated no such cooperation. This highlights a need for improved coordination and partnerships between the public and private sectors.

In terms of future improvements, 60% of respondents called for better infrastructure to support sustainable practices. Meanwhile, 20% emphasized the need for new policies, and another 20% pointed to the importance of increased funding. Additionally, 50% of institutions expressed interest in participating in pilot projects or initiatives related to sustainability in the furniture sector, especially those involving policy development or practical implementation of reuse and recycling systems.

Finally, when asked whether incentives or support mechanisms for reuse or recycling of furniture existed, 75% of respondents either stated none were in place or were unaware of any, while only 25% acknowledged the existence of some support programs. This clearly illustrates the gap in awareness and availability of enabling frameworks to foster sustainable practices.

Bosnia and Herzegovina

As part of the Erasmus+ SUSFUR project, structured field research was conducted with public sector institutions in Bosnia and Herzegovina, with a focus on their roles in supporting sustainable practices within the furniture industry. The goal was to assess current policies, practices, partnerships, and

readiness for circular economy implementation. The research covered institutions from Sarajevo, Zenica, Tuzla, and national-level agencies. Four organizations responded to the public sector questionnaire, representing regional development agencies, chambers of commerce, and business innovation support structures.

1. Institutional Roles in the Furniture Sector

The surveyed public institutions fulfill diverse and complementary roles in the context of the furniture and wood-processing industry:

- Development agencies are directly engaged in implementing regional economic development projects aimed at improving SME competitiveness, innovation capacity, and sustainability.
- Business innovation centers offer support to startups and companies through digitalization programs, often working with firms in or linked to the furniture industry (e.g. tech companies providing digital tools for design and optimization).
- Chambers of commerce serve as policy advocates and intermediaries between companies and state institutions, promoting economic growth and representing business interests—including those in the furniture sector.

These roles encompass regulatory awareness, SME engagement, and strategic program implementation. Collectively, they represent a support ecosystem that is actively involved in the modernization and future development of the wood and furniture value chain in BiH.

2. Existing Policies and Initiatives

The surveyed public institutions play diverse but interconnected roles, including:

- Implementing development and innovation projects in collaboration with SMEs from the wood and furniture sector;
- Providing advisory and promotional services to support market access, digitalization, and environmental transition;
- Advocating for policy reforms and engaging in regulatory dialogue with decision-makers;
- Offering logistical or infrastructural support for entrepreneurship and circular economy experimentation.

Some institutions also support technology adoption and business clustering—focusing on enhancing competitiveness and innovation capacity among wood-processing enterprises. This positions them as potential multipliers for circular economy principles, especially when systemic support is lacking. These activities are promising but lack long-term strategic anchoring in national policies. There's no centralized, coordinated sustainability framework for public institutions engaged in the furniture sector.

3. End-of-Life Furniture Management

Practices in managing outdated or unused furniture vary widely among institutions:

- Donation is the most common practice: furniture is frequently given to schools or other public bodies that can extend its use.
- One institution repairs and reuses furniture within its premises before disposal.
- Another reports disposal only after repairs are no longer cost-effective or practical.

None of the institutions reported having formalized reuse, recycling, or reverse logistics strategies, nor structured partnerships with reuse or social enterprises. These practices are largely ad hoc and dependent on staff initiative or budgetary flexibility.

4. Challenges in the Furniture Sector

Institutions face several structural and sector-specific challenges:

- Waste management: lack of infrastructure and standardized systems for managing wood waste or end-of-life furniture products.
- Supply chain disruptions: difficulty in sourcing locally produced, sustainable materials or furniture that meets public sector procurement needs.
- Regulatory ambiguity: public officials cite a lack of clear guidelines, especially around integrating sustainability into procurement law or planning.
- Labor shortages: one institution noted the shortage of skilled workers in the furniture sector as a major bottleneck.
- Disconnect between industry and IT sector: BIT Centar identified a gap in collaboration between tech innovation and traditional manufacturing.

These challenges are interlinked and reflect broader systemic weaknesses in sector governance and institutional coordination.

5. Cooperation with Other Stakeholders

All four institutions reported active cooperation with private and public stakeholders:

- Projects often involve collaboration with SMEs, donor agencies, other regional agencies, and educational institutions.
- All four institutions have connections with international innovation networks, facilitating knowledge transfer.

However, these partnerships are primarily short-term and project-based, and there is no formalized public-private forum or permanent cluster initiative focused on sustainability in the furniture sector.

6. Sustainability in Public Procurement

Only one institution reported consistently applying sustainability criteria in their furniture procurement:

- This includes purchasing locally made furniture from eco-friendly materials and ensuring reparability as a procurement criterion.
- Others indicated that while they value sustainability, current public procurement regulations in BiH do not allow enough flexibility to favor green products.
- One respondent emphasized that all procurement is governed strictly by existing public procurement law, which lacks detailed sustainability standards.

This reveals a disparity between intention and practical implementation, driven by legal, procedural, and knowledge-related barriers.

7. Support Mechanisms for Reuse and Circularity

Three of the four institutions acknowledged that some support exists, but it's tied to specific donor-funded or EU-funded projects:

- Support comes in the form of promotion, training, and piloting of sustainable models.
- One institution reported that no internal mechanisms exist for incentivizing reuse or recycling within their operations.

There is no state or cantonal-level program that directly supports public institutions to implement reuse, repair, or donation strategies. As a result, practices rely on staff discretion and temporary project incentives, rather than being embedded in organizational policy.

8. Desired Improvements in Public Sector Involvement

When asked about ideal improvements, institutions provided a variety of recommendations:

- Strategic financial instruments: creation of subsidy programs or grant schemes for sustainable SMEs.
- Faster transposition of EU legislation into national law to improve compliance with evolving standards (CSRD, EUDR, ESG).
- Improved infrastructure: availability of centralized reuse systems, logistics for furniture redistribution, and repair centers.
- Cluster development: emphasized the need for digitalization in the furniture sector and manufacturing clusters.
- Policy integration: merging sustainability goals across industrial, educational, and public administration policy frameworks.

These suggestions reflect a shared desire for long-term structural reform and cross-sector cooperation.

9. Regulatory Gaps and Policy Needs

Public institutions identified several important regulatory shortcomings:

- No formal recognition of reused or refurbished furniture in public procurement legislation, which inhibits its use in tenders.
- Lack of quality or certification standards for sustainable furniture or wood products.
- Unclear procurement evaluation criteria related to lifecycle cost, environmental performance, or repairability.
- Slow implementation of EU sustainability directives at national level (CSRD, ESG, EUDR).

Addressing these gaps is critical for enabling public bodies to procure sustainably and support the green transition.

10. Readiness for Pilot Projects

All institutions expressed enthusiasm and readiness to participate in pilot initiatives. Preferences include:

- Testing green public procurement models;
- Creating repair and reuse hubs or donation systems;
- Participating in education, awareness, and training programs;
- Supporting technology transfer between SMEs and innovation centers.

Several are already engaged in early-stage initiatives and are looking to scale and institutionalize their involvement. This demonstrates strong alignment between public sector capabilities and SUSFUR's pilot goals.

Focus group: business sector

Slovenia

Here we present the results of a structured survey conducted among stakeholders from the business sector within the furniture and wood-based industries. The research was conducted as part of the Erasmus+ SUSFUR VET project to assess awareness, readiness, and practices related to sustainability, circular economy, and resource efficiency in industrial contexts.

Participants represented a diverse group of Slovenian companies producing wooden buildings, furniture, doors, windows, flooring, and custom joinery. The questionnaire was sent to all members of the Slovenian Wood Industry Cluster. All together answered 14 different company representatives. All companies fill online questionnaire

1. Company Profiles and Product Focus

The companies that participated in the survey manufacture a wide variety of products, including:

- Wooden houses and prefabricated buildings
- Furniture (custom-made, modular, upholstered)
- Wooden structural components
- Interior and exterior joinery (doors, windows)
- Beds and slatted frames
- Parquet flooring

This diversity reflects a strong cross-section of the Slovenian wood-processing and furniture sector.

2. Awareness and Implementation of the Circular Economy Model

- 73% of respondents were familiar with the circular economy model
- However, 53% stated that their company had not formally introduced the concept to them
- Among those who had received information, the main channels included:
    - Application of circular principles in raw material management
    - Waste collaboration with specialized companies
    - General awareness of opportunities for circular integration

3. Extending Product Lifespan

Respondents identified multiple strategies their companies use to prolong product life:

- 73%: Repair and maintenance
- 13%: Reuse of components
- 13%: Recycling packaging materials

This indicates that durability and serviceability are becoming increasingly relevant in product design.

4. Sustainable Product Design Priorities

Companies reported several areas of focus during product development:

- 79% improve production processes to reduce energy and water consumption
- 43% design components to be recyclable or reusable

- 21% use sustainable or recyclable packaging
- Additional efforts include:
    - Designing products for modular repair (replaceable parts)
    - Use of energy-efficient materials and construction techniques
    - Emphasis on structural wood as a sustainable material

5. Use of Recycled Materials in Product Development
When asked whether they would choose recycled or reused raw materials if they were part of a product development team:

- 40% responded "Yes"
- 53% answered "Maybe"
- 7% said "No"

This demonstrates openness to sustainable sourcing, though practical constraints likely influence decisions.

6. Adaptability to New Consumption Standards
A strong majority (87%) believed that their company could adapt to changing consumption and sustainability standards, indicating high readiness for transformation.

7. Market Competitiveness of Sustainable Products

- 53% consider sustainable products competitive
- 33% believe they might be competitive
- 13% disagreed

This shows that while confidence in market acceptance is growing, doubts remain about consumer willingness to pay.

8. Consumer Perceptions in Slovenia
Interestingly, 60% of respondents believe Slovenian consumers are not yet inclined toward sustainable products, while only 36% believe they are. This reflects a perceived disconnect between industry supply and market demand. Many customers or users are not willing to pay more for recycled or reused products. Sustainable materials need to be priced similarly to, or even lower than, conventional ones.

9. Reverse Logistics and Product Take-Back

- Only 13% of companies take back used products
- Those who do sort materials and send them for recycling

This indicates that reverse logistics and post-use recovery are not yet widely implemented.

10. Use of Energy- and Waste-Reducing Technologies
A significant number of companies are using modern technologies to reduce energy and material use:

- 71% use energy-saving technologies (e.g. CNC machines, LED lighting, optimized extraction systems)
- 64% use tools for material optimization and waste reduction (e.g. digital planning, AI, lean management, custom packaging planning)

These technologies help companies increase efficiency while moving toward sustainability goals.

11. Drivers of Circular Economy Integration

When asked what motivated circular economy practices, respondents cited:

- Increased innovation potential (71%)
- Competitiveness pressures (14%)
- Legal obligations (7%)
- Uncertainty or lack of awareness (7%)

This highlights that market dynamics and internal development are stronger drivers than regulation.

Netherlands

The Dutch furniture and wood industry is slowly but surely moving towards more sustainable and circular ways of working. Based on answers from ten different companies, including Vepa Drentea, Van de Sant, and Expertisecentrum Meubel, we can see that many businesses are aware of the importance of sustainability, but their level of involvement varies a lot. Some are already trying new ideas, while others are just getting started.

1. The majority of participating companies specialize in office and interior furniture, with many including modular designs and unique features. Several also focus on acoustic panels, circular furniture systems, and design-driven product lines for the Dutch and worldwide markets.
2. The majority are small and medium-sized enterprises (SMEs), which form the foundation of the sustainable furniture innovation ecosystem.
3. Awareness varies among focus group participants. Just 30% had a thorough comprehension, while 50% were only slightly familiar. The remaining companies had modest exposure but expressed interest in using circular practices where possible.
4. A few companies use modular design and recyclable packaging, although take-back and reuse services are uncommon. Product development incorporates lifecycle thinking, while it is not institutionalized.
5. About 60% are researching or already employing recyclable materials such as wood and steel. However, just a few rely on post-consumer waste streams, citing cost, quality, and availability concerns.
6. About 40% employ tools such as precision cutting, CNC-based modular design, or digital planning software. The widespread adoption of energy-efficient machinery is limited, owing to budget constraints.
7. Participants provided mixed answers. Roughly 40% see a competitive advantage, particularly for B2B or export clients. Others remain wary owing to price sensitivity and low consumer awareness.
8. Demand is dispersed. Some institutional and foreign purchasers value sustainability, whereas end-users prioritize cost. Circular products are frequently targeted at certain market segments.
9. Most don't. There is interest, but logistical and budgetary constraints limit widespread adoption.
10. Participants identified shortcomings in eco-design, material recovery, digital fabrication, and systems thinking. Many workers lack hands-on experience using circular approaches or modular construction logic.

11. Few formal collaborations exist. Collaboration is primarily informal or pilot-based, with firms indicating a strong desire for institutionalized cooperation in curriculum co-design and internships.
12. Yes. Companies want practical, SME-specific training in circular design, lifecycle analysis, and recycled material processing.
13. Most businesses are unaware of or find programs difficult to access. Support is frequently dispersed, and SMEs struggle to manage certification schemes (such as FSC/PEFC).
14. Requests included simpler funding arrangements, access to low-cost training, shared innovation infrastructure, and market matching for sustainable suppliers and clients.
15. Yes. Product design pilots, upskilling initiatives, and real-world testing of reuse or tracking systems were all highly popular.

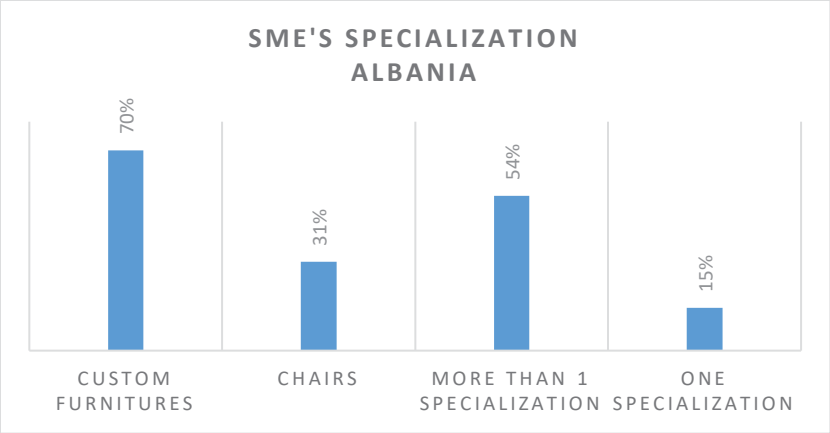
Albania

As part of this project, ESI in collaboration with WICA conducted a survey involving 13 SMEs operating in the wood processing and furniture production sector. WICA led the process through its strong connections with the industry. The sample of companies was carefully selected to represent the sector in terms of size, geographic distribution, and core products. The selected firms operate in the regions of Tirana-Durrës, Fushë-Krujë, Elbasan, Kavaja, Shkodër, Skrapar, and Vlorë.

These companies specialize in the production of various items, including different types of chairs, custom-made furniture (kitchen cabinets, wardrobes, upholstery, bedding, etc), semi-finished wooden frames, fine artistic wooden products, and doors and windows. All surveyed firms have a minimum of 20 employees and are well-equipped with modern technology.

The surveys were conducted using three different communication channels: email, phone interviews, and face-to-face meetings. Given the high workload in the industry during the summer period, in some cases it was necessary to meet companies in person to avoid delays. We also observed that in-person interviews led to a better understanding of the survey questions and, consequently, more accurate responses.

The survey revealed that approximately 70% of the company's focus on customized furniture production, while 31% specialize in chair manufacturing. This includes chairs used in residential spaces, bars and restaurants, offices, and public institutions. Additionally, 54% of the participating SMEs are active in more than one area of production, whereas 15% are specialized in a single product category. The high percentage of companies offering custom furniture of a wide range highlights a key strength of Albanian wood processing and furniture companies: their ability to deliver high-quality, customized furniture tailored to diverse client needs, while maintaining a highly competitive quality-to-price ratio. Bar Chart 1 displays the distribution of surveyed companies according to their primary areas of production specialization, highlighting the prevalence of customized furniture and chair manufacturing.



When asked whether they are familiar with the concept of the circular economy, approximately 62% of respondents answered yes, 15% said no, and the remaining 23% indicated that they had heard of the term but did not understand what it means. Among those who reported being familiar with the concept (62%), all stated that they acquired this knowledge through their workplace. 62.5% of them reported having first encountered the concept during a pilot training session held last autumn by WICA in collaboration with the Faculty of Forestry Sciences funded by the Republic of Slovenia and implemented by UNIDO. Although they are aware that these trainings were limited in scope and duration, they played an important role in raising awareness and served as a valuable starting point. The remaining 37.5% became familiar with the concept through information sessions organized by other institutions. It is important to note that the individuals interviewed were primarily administrators, managers, or production engineers. This may have contributed to the relatively high percentage of respondents who reported being aware of the concept of the circular economy. The results might have been significantly different if the target group had included qualified or unqualified production workers.

When asked which process is more important for extending the product life cycle, 61.5% of respondents identified repair, while the remaining respondents selected reuse. Interestingly, none of the participants mentioned recycling of packaging as an alternative. This is particularly important considering that a significant amount of waste is generated from packaging materials when products are delivered. All surveyed companies are producers and emphasized that both repair and reuse are essential strategies for extending a product's lifespan. They acknowledged that adopting such approaches can increase producer awareness and influence product design to better support durability and after sale value. These practices not only contribute to prolonging the product life cycle but also support local craftsmanship and the second-hand furniture market, while simultaneously reducing the volume of furniture waste sent to landfills. In Albania, it is relatively common to donate or resell used furniture; however, the number of dedicated shops offering such services remains limited despite noticeable growth in recent years.

It was also interesting to analyze the responses to the question regarding the company's focus during the furniture design process. None of the companies selected any of the listed options related to circular economy principles. Approximately 70% reported that their main priority is meeting customer needs in terms of design, aiming to make the furniture as customized as possible. This once again highlights the comparative advantage of the Albanian furniture industry, where producers are highly customer-oriented.

Another key focus during production is the durability of the product. We also observed that companies working primarily with solid wood panels (around 15% of the total sample) tend to show greater attention to sustainability.

Wfhat we understood from conducting these interviews is that, even without explicitly applying circular economy concepts, the focus on customization and durability indirectly contributes to extending the product's lifespan.

When asked whether they would choose raw materials derived from recycled waste, 69% of respondents answered yes, while the remaining respondents answered maybe. We interpret this outcome as a clear indication of willingness to shift toward the use of recycled raw materials. However, this willingness may be conditional, as companies could become more reluctant if such materials come with significantly higher costs.

61.5% of the companies stated that they have the capacity to adopt new consumption standards, even though they are aware that this may require increased investment costs.

46% of the companies stated that products with sustainable features are more competitive in the market, while the remaining 54% responded with "maybe." The companies that answered positively are primarily those engaged in export activities, which may explain their greater awareness of international market trends and consumer expectations.

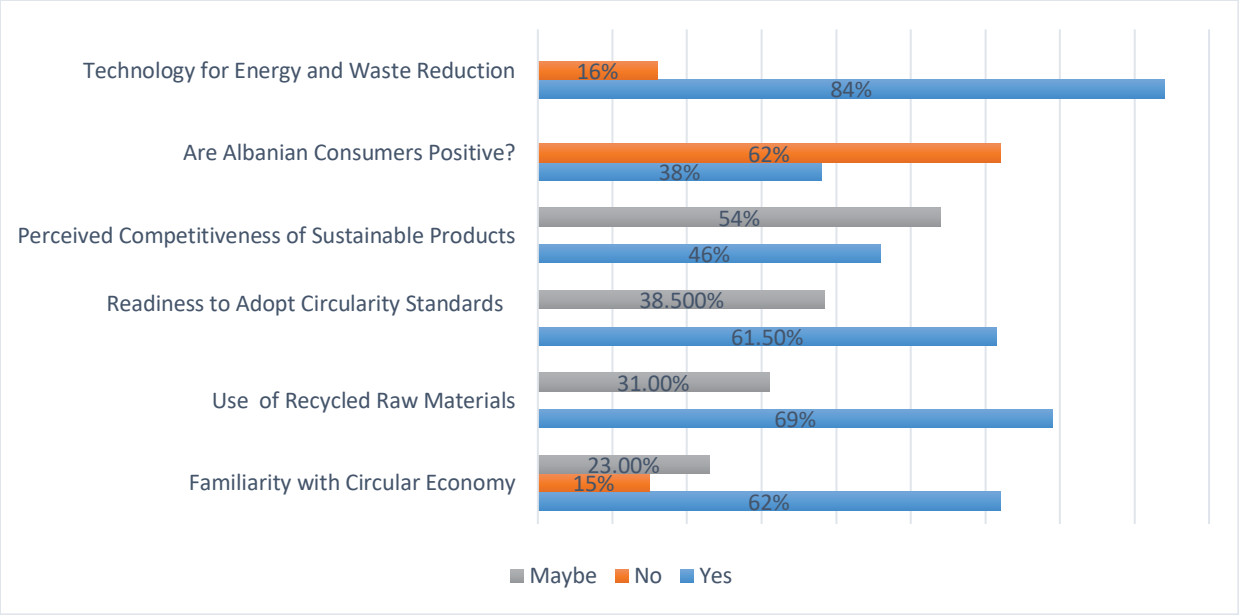
This finding aligns with responses to another survey question regarding whether Albanian consumers are positively inclined toward sustainable products. Only 38% of companies believe that local consumers are positive, while the majority feel that the Albanian market is still not fully ready to embrace such products on a larger scale.

None of the surveyed companies reported having a product buy-back system in place. In some cases, products are returned by customers for various reasons; however, these items typically end up in showrooms. Due to their customized nature, they are often more difficult to resell.

84 % of the surveyed companies reported having implemented technologies and measures to reduce energy consumption and minimize production waste. In general, these efforts include investments in CNC machinery, LED lighting, solar panels, and pellet and briquette production lines. However, only 15% of these companies have invested specifically in solar panels or pellet and briquette production.

The majority achieve energy and material efficiency primarily through the use of modern CNC machinery, particularly from reputable Italian and Turkish manufacturers, which help reduce both energy use and production waste.

Despite these advancements, further efforts are still needed to significantly reduce waste and energy consumption across production facilities.



The responses to the question on what motivates companies to follow circular economy principles in product development were interpreted as indicators of potential motivation for the future rather than current drivers. 38% of companies identified competition, 38% innovation, and 24% legislation as motivating factors.

This distribution suggests that companies are primarily driven by market dynamics and the need to remain competitive and innovative. Circular economy practices are increasingly seen as ways to differentiate products, improve efficiency, and respond to evolving customer expectation especially in export-oriented segments.

Although only 24% choose legislation, this is likely due to the current lack of binding circular economy regulations in Albania. However, with Albania's progress toward EU accession by 2030, regulatory alignment with the European Green Deal and circular economy directives is expected to increase. This indicates that legislation will likely become a stronger motivating factor in the near future, pushing companies to adapt in anticipation of future compliance requirements.

Overall, the results point to a proactive but market-driven readiness to adopt circular practices, which could be accelerated through targeted policies, incentives, and support for innovation.

In summary, the findings show that while there is a certain level of awareness and willingness among Albanian companies to engage with circular economy principles, there is still a clear need for more targeted information, training, and workshops. These efforts are essential to help businesses understand how to begin implementation in practice especially as upcoming EU legal frameworks will soon require greater alignment with circular economy standards. While direct application of circular practices remains limited, companies prioritize customization, durability, and innovation, factors that indirectly support product longevity. Export-oriented firms are more open to sustainable approaches, though cost and limited consumer demand remain challenges. It is important to mention that these companies need also financial support from the government and international organizations to start implementing these standards.

Montenegro

As part of the SUSFUR VET project's effort to assess the readiness and involvement of the business sector in sustainable practices within the furniture and wood-processing industry in Montenegro, a survey was distributed to selected companies. A total of 10 companies responded, providing insights into their production focus, awareness of circular economy principles, and attitudes toward sustainability.

The companies represented a mix of sectors, with 42.9% identifying furniture as their main product, while others mentioned decorative items, garden furniture, window glass, and even IT services. This diversity reflects the broad network of industries related to furniture and wood products.

Awareness of the circular economy model was moderate. While 28.6% of respondents said they were familiar with the concept, an equal 28.6% said they were not, and 42.9% had heard of it but did not fully understand it. Despite this, 71.4% indicated that their companies had informed them in some way about circular economy practices. These included cooperation with waste management companies and reusing materials in production, although internal training on the topic remained limited.

Companies were asked about their views on extending the life cycle of products, and 42.9% saw packaging recycling as a viable method, while 28.6% each highlighted product repair and reuse. This shows a relatively balanced understanding of circular strategies. In terms of design priorities, 42.9% of respondents reported that their companies do not consider recyclability at all, while 28.6% focus on energy-efficient production processes and 14.3% on sustainable packaging.

When asked if they would personally choose raw materials from recycled sources as part of a product development team, 57.1% responded positively, while 28.6% said "maybe" and only 14.3% said no. This reflects a generally open attitude toward sustainable material sourcing.

Regarding adaptability to new consumption standards, 71.4% believed their company could adapt, showing optimism about change. However, confidence in market competitiveness of sustainable products was lower: 42.9% saw them as competitive, while 57.1% disagreed. Similarly, 57.1% believed that Montenegrin consumers were not yet positively inclined toward sustainable products, suggesting a perception of low consumer demand.

Only 14.3% of companies reported engaging in buy-back or take-back schemes for their products. Among those who did, reuse was limited and often informal. Furthermore, only 14.3% indicated the use of technologies that support waste reduction or resource optimization, such as cutting optimization software. The remaining 85.7% did not report the use of such technologies, revealing a significant opportunity for digital transformation and innovation in the sector.

When exploring motivations behind adopting circular economy principles, the most cited reason was competition (66.7%), followed by regulatory requirements (16.7%) and innovation (16.7%). This suggests that market pressure is a stronger motivator than environmental policy or internal innovation culture.

The survey of the business sector in Montenegro indicates a basic awareness of circular economy practices and a general openness to adopting more sustainable approaches. However, there is a clear need for better education, technological investment, and consumer awareness. Companies seem motivated by competitive advantage but are constrained by limited knowledge, infrastructure, and perceived market demand. These findings underline the importance of targeted support, training programs, and pilot projects to foster sustainability and circularity in Montenegro's furniture industry.

Bosnia and Herzegovina

As part of the Erasmus+ SUSFUR project, field research was conducted among micro, small, and medium-sized enterprises in the furniture manufacturing sector in Bosnia and Herzegovina focusing on Tuzla Canton. The aim of the research was to examine existing practices related to sustainability and the circular economy, identify the level of awareness and readiness of companies to adapt to these principles, and detect specific needs and barriers in the transformation process.

The questionnaire was distributed to a sample of 10 companies actively operating in the furniture production sector, including traditional wooden furniture, upholstered furniture, office and kitchen furniture. The survey was conducted during [insert period] through online questionnaires and follow-up telephone interviews.

1. Company Profiles and Product Focus

Common characteristics of the surveyed companies include:

- Most are small enterprises (up to 50 employees)
- Geographically spread across various regions in BiH, with most concentrated in the industrial zones of Tuzla, Sarajevo, Živinice, and Banja Luka
- Their product range includes:
    - Kitchen and office furniture
    - Upholstered furniture (sofas, armchairs, beds)
    - Custom-made furniture for local and international markets
    - Wooden elements and interior structures

This indicates the diversity of offerings and the flexibility of these companies in meeting specific market demands, as well as potential for introducing sustainable innovations at all stages of production.

2. Awareness and Understanding of the Circular Economy

- 70% of companies are familiar with the concept of the circular economy
- However, only 30% actively implement concrete circular principles
- Main sources of information include previous EU projects, cooperation with educational institutions, and online resources

Companies that partially apply circular practices do so through:

- Optimization of raw material use
- Sorting and selling waste (e.g., sawdust, chipboard leftovers)
- Reuse of packaging materials

Other respondents expressed interest, but also a need for additional information, best practice examples, and concrete financial incentives.

3. Product Lifecycle Extension Strategies

Strategies companies use to extend the life of their products include:

- 50% offer repair and replacement services
- 40% use modular design that enables easier repair
- 30% apply replaceable materials and accessible upgrade-friendly design
- 20% have not developed any specific strategies for extending product life

Most companies recognize the importance of such practices, but a lack of customer demand for sustainable options is a key barrier to wider adoption.

4. Sustainable Design and Material Use

Design and material use are directly linked to product sustainability. Survey results show:

- 70% use energy-efficient materials
- 60% apply process optimization principles (e.g., digital planning, waste minimization)
- 30% use recycled materials (e.g., pallet wood, chipboard waste)
- Only 10% use eco-friendly coatings and adhesives

While most companies are open to using recycled raw materials, they emphasize that price and quality are often barriers.

5. Technological Innovation and Energy Efficiency

Technology plays a key role in improving sustainability. Among the surveyed companies:

- 60% use CNC machines and LED lighting
- 40% apply software tools for material cutting optimization
- 20% track energy and waste consumption

Several companies expressed interest in additional support and training for using advanced software solutions (e.g., lean production and waste tracking).

6. Consumer Perception

There is a prevailing doubt about the BiH market's readiness to accept sustainable products:

- 70% believe that customers are not willing to pay more for recycled or modular products
- 20% observe growing interest among younger clients and some hospitality businesses
- 10% believe the market lacks sufficient information on the benefits of sustainable solutions

There is a clear opportunity for awareness-raising campaigns and end-user education.

7. Product Return Logistics (Reverse Logistics)

Reverse logistics is rarely implemented:

- 90% of companies do not offer product return services
- One company reuses recovered components to create new pieces upon request
- Most companies cite cost and logistics challenges (transport, storage, sorting) as key obstacles

8. Drivers and Motivation

When asked what motivates them to adopt circular economy principles, companies cited:

- 50% – market competitiveness
- 30% – cost reduction and efficiency
- 20% – compliance with legislation and project expectations

Interestingly, legal pressure is not the primary driver, suggesting a need for systemic incentives and stronger regulatory frameworks.

9. Readiness for Pilot Projects

- 60% of companies are open to participating in pilot projects
- Suggested forms of support include:

- Technical assistance and expert advice
- Participation in training and knowledge exchange
- Visibility through joint EU platforms

This provides a solid foundation for launching localized pilot initiatives in BiH.

Focus group: VET sector

Slovenia

As part of the SUSFUR Erasmus+ project, a field study was conducted also to targeting institutions involved in Vocational Education and Training (VET) related to the furniture and wood sectors. The questionnaires were sent to five institutions that provide secondary and tertiary education — specifically, three vocational education and training (VET) centres and two higher education institutions. All of them offer at least some educational programs related to the wood industry. The aim was to understand current educational practices, the inclusion of sustainability principles, the level of engagement with circular economy concepts, and readiness to participate in pilot initiatives. A standardized questionnaire was developed collaboratively by the project partners, translated form English to Slovenian, and distributed using the online platform 1ka.si. Respondents were reminded multiple times to complete the survey, and in cases of non-response, direct telephone interviews were conducted using the same questionnaire.

1. Survey Participants

The VET questionnaire was completed by representatives of five institutions, covering different types of schools:

- Technical Schools (40%)
- Secondary Vocational School (20%)
- Combined Technical and Higher Vocational School (20%)
- University (20%)

These institutions offer programs mainly in wood science, and other related topics such as construction, mechanical engineering, and related technical fields.

2. Fields of Study and Education Levels

Institutions reported offering education in wood technology, construction, materials, technology, and pedagogy. The educational levels span from lower secondary (IV and V) to higher tertiary levels (VII/1, VII/2, VIII).

3. Integration of Sustainability in Curricula

There are two main ways in which institutions integrate sustainability into their curricula

- One institution integrates sustainability through individual teacher efforts.
- Another focuses on the efficient use of wood.

4. Challenges in Implementing Sustainability

The main challenges identified include:

- Difficulty in understanding sustainability concepts.
- Slow integration of updated curricula and educational reforms.

5. Cooperation with External Partners

Only one institution reported collaboration with external partners in sustainable furniture production. The cooperation mainly consists of students doing mandatory internships. Other institutions do not collaborate with external partners in teaching about sustainability

6. Knowledge on Reuse and Recycling

Sixty percent of respondents confirmed that students are taught about reuse and recycling. Covered topics include:

- Furniture restoration and repair.
- Repurposing of used furniture.
- Development of sustainable tourism products using natural materials. In this case, the focus is primarily on the use of solid wood and environmentally less harmful surface treatments, such as oiling wooden surfaces.

7. Barriers to Wider Adoption

Barriers identified include:

- The cultural preference for "new" items.
- Abundance of cheap new products on the market.
- Financial, motivational, and time constraints within VET institutions.

8. Competences Needed for Sustainable Furniture Industry

- Understanding sustainability and circular principles.
- Skills in restoration and reuse.
- Raising awareness through early education and family values.

9. Availability of Educational Resources

Most respondents (67%) felt that there is a lack of adequate training materials. One respondent emphasized the need for technological content to support such education.

10. Support Mechanisms

Support resources that would be beneficial include:

- Access to expert knowledge.
- Practical case studies and examples.

11. Priorities for Improving Education

Key priorities identified were:

- Leadership support and company visits.
- Promotion of reuse and sustainable practices through awareness campaigns.

12. Conclusion

The results of the VET sector survey indicate a foundational awareness and willingness to integrate sustainability and circular economy principles in furniture-related education. However, systemic barriers such as outdated curricula, lack of targeted teaching materials, and institutional inertia remain significant

challenges. While individual teachers often take initiative, broader institutional and policy support is necessary.

There is a clear opportunity for the SUSFUR project to make an impact by providing structured resources, supporting teacher training, and facilitating collaboration between VET institutions and sustainable industry actors. The openness of institutions to participate in pilot initiatives demonstrates the potential for scaling up innovative educational approaches. To ensure lasting change, the development of modular teaching content and practical engagement activities—such as site visits, workshops, and hands-on restoration projects—should be prioritized. These findings will directly inform the next stages of project development, especially in creating tailored educational materials and engaging VET institutions in capacity-building activities across partner countries.

Netherlands

Vocational Education and Training (VET) schools in the Netherlands are becoming more active in teaching students about sustainability in the furniture and wood sector. Ten schools joined this research, including HMC (Hout- en Meubileringscollege), ROC van Amsterdam, Fontys, Wageningen University & Research, and Deltion College. These schools offer a mix of programs, from hands-on carpentry and furniture making to construction, product design, and digital production. Students graduate at different levels, often between EQF 3 and EQF 6.

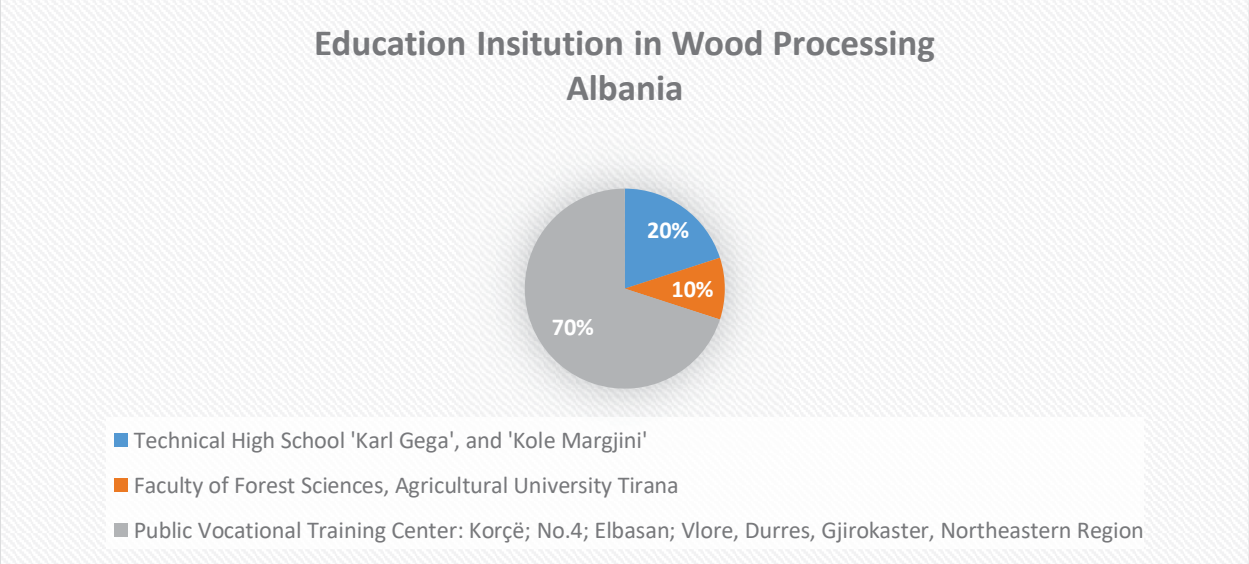
1. Institutions provide a variety of vocational (EQF 3-4) and advanced vocational (EQF 5-6) programs in furniture manufacturing, carpentry, product design, and construction technology. Participants included HMC Amsterdam, ROC van Amsterdam, and Wageningen UR, among others.
2. Circular design, recycled material use, and product lifecycle thinking have been fully integrated by approximately 30% of universities. Others are gradually including such curriculum, typically through project-based modules.
3. The main challenges identified include: limited financial resources, as noted by 40%; lack of modern curricula and instruments for circular production; there is a shortage of trained teachers in eco-design, robotics, and material reuse; and the misalignment between industry advancements and curriculum update cycles.
4. Approximately 40% of schools offer hands-on instruction in wood recycling and disassembly-based design. However, such initiatives are frequently limited in scope, prompting calls for improved access to robotic tools, material libraries, and testing environments.
5. Only 20% indicated continuous connections, usually through student placements, collaborative labs, or one-time projects. Institutions expressed a significant desire to strengthen industry partnerships in order to improve practice-based learning.
6. Essential skills include: eco-design and lifecycle analysis; practical knowledge of recycled materials; digital fabrication and modular construction; systems thinking and environmental impact modeling.
7. 60% of respondents thought present resources are insufficient, often focusing on university-level theory rather than vocational application. They stressed the importance of modular, visual, and tool-based content.

8. Priorities include: funding for equipment (e.g., CNC routers, digital saws); "Train-the-trainer" programs for educators; industry-aligned e-learning modules; space and resources for labs.
9. Yes, almost all institutions expressed enthusiasm for piloting.

Albania

WICA, in collaboration with ESI, selected 10 educational institutions that offer programs dedicated to wood processing and furniture production. The survey was designed using open-ended questions, and the necessary information was collected through face-to-face or phone interviews. The respondents included the Chair of the Wood Processing Department at the Faculty of Forestry Sciences, Agricultural University of Tirana; two wood processing instructors from the 'Karl Gega' and 'Kole Margjini' Technical High Schools; and the designated representatives of the public Vocational Training Centers throughout Albania responsible for delivering training courses in furniture production.

Among them, 20% are vocational high schools that provide programs in wood processing, leading to the qualification level of Vocational Technician upon graduation. Another 10% belong to the higher education system, offering Bachelor's degrees in Wood Processing Engineering and Master's degrees in Interior and Furniture Design. The remaining 70% are public vocational training centers distributed across Albania, which offer short-term training courses in furniture production. Upon completion, participants achieve the level of Qualified Worker in wood processing. The graph below illustrates the distribution of these institutions by type.



Integration of Sustainability in Wood Processing and Furniture Production Curricula

The Faculty of Forestry Sciences integrates sustainability principles related to the furniture sector by encouraging students to apply green practices and explore innovation within the industry. For students enrolled in the Furniture and Interior Design program, new techniques have been introduced in studio design courses to promote alignment with sustainability and circular economy concepts. Additionally, a dedicated course on Circular Economy has been incorporated into all study programs, harmonized with the curriculum of BOKU (University of Natural Resources and Life Sciences, Vienna).

Technical High Schools such as 'Karl Gega' in Tirana and 'Kole Margjini' in Shkodra are in continuous collaboration with the National Agency for Education, Vocational Training and Qualifications (AKAFPK). These institutions participate in annual meetings to discuss general curriculum challenges and keep pace with technological developments in the sector, often in collaboration with private sector partners. Based on these consultations, curriculum adjustments are made when necessary.

However, according to interviews conducted with school representatives, there are currently no specific subjects dedicated to sustainability or the circular economy integrated into their curricula. The same observation applies to the seven public vocational training centres included in the study, where interviewees confirmed the absence of dedicated content on sustainability and circular economy topics.

Partnerships with Industry on Sustainable Furniture Manufacturing

All surveyed institutions report having partnership agreements with companies operating in the wood processing and furniture production sector. Public Vocational Training Centers and Technical High Schools primarily collaborate with small, local firms, which host students for internships or study visits. While these companies are generally not focused on sustainability, they occasionally offer services such as the repair of old or damaged furniture.

In contrast, the Faculty of Forestry Sciences maintains partnerships with larger companies, often oriented toward exports and equipped with modern technology. They have higher production capacities. However, while these collaborations are active, they are not specifically centered on sustainable furniture manufacturing.

Key Challenges in Integrating Sustainability into VET Programs

Despite differences in the qualifications they offer, all institutions reported similar challenges: the lack of dedicated laboratories equipped with the necessary tools and the shortage of qualified staff to teach sustainability-related topics.

Training on Wood Recycling and Reuse of Wood Products and Furniture

Technical high schools report that they do not offer dedicated training programs on wood recycling or the reuse of wood products. However, in certain cases (when previously used wooden panels are in good condition) these materials may be repurposed for internal use or integrated into cross-curricular school projects.

Similarly, public vocational training centers do not provide formal training in wood recycling or reuse. Nonetheless, some elements related to furniture repair are incorporated into existing subjects within their curricula.

At the Faculty of Forestry Sciences, there are no specialized training modules focused on wood recycling or the reuse of wood products. However, during their bachelor studies, students are introduced to related concepts, particularly those concerning the repair and reuse of furniture.

Barriers to Adopting Wood Recycling and Reuse Practices in Vocational Training

All institutions indicated that one of the main barriers is the prevailing orientation of the industry toward the production of new furniture, with limited focus on circular economy principles. Another significant factor mentioned is the lack of enforcement of regulations related to waste management and wood recycling. Additionally, institutions highlighted that furniture repair processes are often time-consuming and offer limited financial returns, making them less appealing to younger generations entering the field.

Needed Resources to Enhance Sustainability Training in VET

Technical high schools and public vocational training centers emphasize the need for updated educational materials, training programs for technical-teaching staff, and hands-on projects involving both teachers and students. These initiatives, particularly when supported by material incentives, are seen as effective ways to strengthen sustainability-related training.

The Faculty of Forestry Sciences (FoFS) highlights the importance of funding for pilot projects that support students with innovative ideas and startups. Additionally, FoFS underscores the need for increased collaboration with industry specifically through strengthened partnerships with companies that are interested in implementing sustainable practices.

Interest in Participating in SUSFUR Pilot Trainings or Testing New Educational Materials

All institutions expressed interest in participating in SUSFUR training programs or in testing new educational materials focused on sustainability in furniture production, wood processing, and circular economy practices.

To summarize, the survey analysis highlights key differences in needs between vocational education and training (VET) institutions and the Faculty of Forestry Sciences (FoFS). While all institutions show interest in sustainability, VET centers and technical high schools lack dedicated content, qualified staff, and proper equipment to deliver training on sustainability, recycling, and reuse in furniture production. They call for updated materials, staff training, and practical projects to enhance delivery.

FoFS has made progress by integrating a circular economy course and aligning parts of its curriculum with international standards, but still lacks specialized training in wood recycling and reuse. It emphasizes the need for funding and stronger collaboration with organizations and sustainable industry partners.

All institutions expressed interest in participating in SUSFUR pilot trainings and testing new educational materials, underlining a shared need for capacity-building in sustainable wood and furniture production.

Montenegro

This survey involved ten Vocational Education and Training (VET) institutions exploring how sustainability, particularly in the furniture sector, is integrated into their programs. The institutions represented a diverse mix of technical schools, vocational colleges, apprenticeship centers, and one specialized training institute making up.

Graduates predominantly achieve qualifications aligned with Montenegro's National Qualifications Framework (MQF), which corresponds to the European Qualifications Framework (EQF).

Specifically, 60% of students reach MQF/EQF Level 4, 30% attain Level 3, and 10% complete Level 5. This distribution highlights a strong emphasis on mid-level qualifications that prepare students for technical roles in the furniture sector.

Seventy percent of institutions have incorporated sustainability into their curricula. This includes topics such as sustainable sourcing of materials, energy-efficient production techniques, and life-cycle analysis of furniture products. However, a significant 30% have yet to integrate these themes, indicating room for growth.

Among those incorporating sustainability, the most pressing challenges were outdated training materials (70%), insufficient teacher training (60%), and limited funding (50%). These obstacles suggest that while awareness is present, institutions need updated resources and staff development to effectively deliver sustainability education.

Sixty percent of institutions collaborate with sustainable furniture manufacturers, offering students practical experiences through internships, guest lectures, and site visits. This partnership model enhances real-world learning but remains underutilized by 40% of institutions.

Half of the institutions currently provide specific training on wood recycling and reuse. Among these, the majority focus on furniture refurbishment (80%), followed by circular economy principles (60%) and waste reduction strategies (50%). These focus areas underscore a growing commitment to circularity in furniture production.

Institutions cited lack of equipment (60%), insufficient staff expertise (50%), and limited access to recycled materials (40%) as key barriers to expanding wood recycling and reuse training. Addressing these will be critical for scaling sustainability efforts.

Institutions emphasized that students need skills in eco-design, repair techniques, and the use of digital tools for waste-efficient furniture design. Despite this, 70% of institutions find current training resources insufficient to fully equip students with these competencies.

To improve education quality, 80% of institutions expressed a desire for interactive digital learning modules. Additionally, 70% requested real-world case studies to bridge theory and practice, while 60% called for increased teacher training. Half also stressed the importance of better access to recycled materials to support hands-on learning.

Encouragingly, 80% of institutions showed interest in participating in pilot programs or testing new educational materials under the SUSFUR project. This highlights a willingness among VET providers to innovate and improve sustainability education.

The survey reveals a positive trend toward embedding sustainability in furniture sector training within VET institutions. However, significant gaps remain in resources, teacher preparedness, and infrastructure. Overcoming these challenges through updated materials, targeted staff development, and stronger industry partnerships will be vital to fully integrate sustainable practices into vocational education. The high interest in initiatives like the SUSFUR project offers a promising avenue to advance these goals collaboratively.

Bosnia and Herzegovina

In alignment with the Erasmus+ SUSFUR project's overarching goals—to enhance sustainability and circular economy principles within the furniture production sector—a targeted field research study was conducted in Bosnia and Herzegovina to assess the preparedness, practices, and perspectives of vocational education and training (VET) institutions.

The research focused on understanding how VET providers currently engage with topics such as circular design, recycling of wood-based products, and sustainable material use. Particular attention was paid to curriculum integration, institutional barriers, pedagogical gaps, and readiness for piloting new educational content.

The data was collected from four key institutions:

- Srednja stručna škola Srebrenik
- Faculty of Mechanical Engineering, University of Tuzla
- Faculty of Mechanical Engineering, University of Sarajevo
- Biotechnical Faculty, University of Bihać

These institutions represent both secondary and higher VET providers, giving a broader picture of the system's vertical alignment regarding sustainability education. The research was conducted between May 8 and June 20, 2025, through structured online surveys supported by telephone follow-ups.

2. Institutional Integration of Sustainability and Circular Economy

The integration of sustainability into institutional practices and curricula remains partial and inconsistent across VET providers. While all respondents acknowledge the relevance of circular economy principles, their implementation tends to be fragmented and not formally embedded in institutional strategies.

- Secondary VET institutions, such as Srednja škola Srebrenik, reported limited yet tangible integration of sustainability themes in vocational modules, focusing mainly on waste reduction and basic environmental responsibility.
- Faculties of mechanical engineering (Tuzla and Sarajevo) noted that although individual lecturers may introduce sustainability concepts, curricular structures have not been formally adapted to include circular principles.
- Biotechnical Faculty in Bihać cited partial integration through specific modules but emphasized the lack of institutional capacity for broader implementation.

There is a notable absence of cross-curricular frameworks or dedicated programs that would systematically address sustainability and reuse in the context of the furniture or wood-processing sectors.

3. Availability and Structure of Training on Wood Recycling and Reuse

Training in wood recycling and the reuse of furniture is currently offered only sporadically and not as a structured program:

- Only one institution confirmed offering some form of training on this topic, yet stated that it is not delivered at the depth or frequency required.
- Other institutions reported that such topics are only touched upon marginally or as part of broader technical education.

- There is no use of industry-aligned learning materials, nor is there a clear alignment with occupational standards or skill frameworks for sustainable woodwork or product life extension.

These findings suggest that, despite theoretical awareness, pedagogical practice in this area is underdeveloped and lacks systematization.

4. Curriculum Content Related to Circular Economy and Sustainable Furniture

Where topics related to sustainability are covered, they tend to focus on:

- Basic waste management and reduction techniques
- General awareness of environmental impacts of production
- Upcycling concepts introduced informally or through extracurricular activities
- Introductory concepts of the circular economy (rarely tied to practical outcomes)

The lack of standardized, modular content on eco-design, material circularity, or sustainability metrics limits the ability of VET institutions to prepare students for emerging roles in green industries.

5. Institutional and Structural Barriers

Several critical barriers were identified by respondents:

- Lack of teaching expertise and continuous professional development in sustainability fields
- Curriculum rigidity in public institutions, where program changes require central-level approval
- Disconnection from the private sector, resulting in a lack of real-world application opportunities
- Insufficient investment in equipment and labs, limiting the ability to simulate sustainable production processes
- Limited national policy support and absence of VET system incentives for sustainability integration

Together, these barriers create a systemic misalignment between labor market needs and educational offerings.

6. Priority Skills for Sustainable Furniture Production

When asked about essential skills for students entering the sustainable furniture industry, respondents emphasized:

- Digital skills, particularly in CAD/CAM and simulation software for material efficiency
- Knowledge of production workflows in sustainable manufacturing environments
- Hands-on repair, reuse, and product transformation capabilities
- Critical thinking and problem-solving in resource-constrained design

There was consensus that practical, workshop-based learning is essential, but it is constrained by outdated equipment and a lack of connection with green SMEs.

7. Training Materials and Pedagogical Resources

Responses revealed a significant deficit in modern, localized training materials:

- Most respondents reported that materials on sustainability in the furniture sector are either outdated, insufficiently contextualized, or not tailored to student needs.
- There is no shared repository or national initiative to curate or disseminate such resources.
- One respondent noted uncertainty due to a lack of institutional focus on this area, suggesting weak internal knowledge management practices.

8. Institutional Needs and Resource Gaps

To improve the delivery of sustainability-related education, institutions identified several support needs:

- Access to structured learning modules and teaching guidelines
- Professional development for teaching staff on circular design and environmental management
- Technical equipment and digital infrastructure to simulate real-world production and waste management
- Strategic partnerships with industry for experiential learning and curriculum co-design
- Financial support to develop and pilot innovative training approaches

Respondents stressed the importance of blended approaches, combining theory with practice in collaboration with local enterprises.

9. Strategic Priorities for Reform

Participants proposed several priority areas for VET reform in the context of the green transition:

1. Policy-level curriculum modernization, allowing for the incorporation of flexible modules on circularity and sustainable design
2. Integration of industry input in program planning and validation
3. Increased collaboration with SMEs and sector associations, especially those in green or circular business models
4. Public campaigns to reposition sustainability as a viable and attractive career path
5. National investment in training-of-trainers programs to build system-wide capacity

10. Institutional Readiness for Pilot Engagement

All surveyed institutions expressed clear interest in participating in pilot initiatives under the SUSFUR project, including:

- Testing of new curriculum modules and hands-on activities related to sustainability
- Joint development of educational resources with project partners
- Involvement of students in workshops, internships, and project-based learning
- Exchange of best practices and cross-institutional learning

This readiness presents a strong foundation for piloting and scaling sustainability-focused innovations in the VET sector.

Comparative analysis: public sector focus groups

Dimension	Slovenia & Netherlands	WB Countries (Albania, BiH, Montenegro)
Policy Frameworks	Robust national circular economy strategies (e.g., Netherlands' LAP, Slovenia's CPU network); legally integrated sustainability in procurement	Mostly fragmented, with project-based CE activities; Albania is drafting a CE roadmap, but lacks enforcement; BiH and MNE have limited implementation at municipal level
Reuse & Infrastructure	Active reuse centers, donation networks, and municipal repair hubs	Albania and MNE lack formal centers; BiH has minor reuse initiatives but poor coverage
Challenges	Technical (e.g., standardizing modularity and traceability); administrative (e.g., public procurement laws lagging behind CE needs)	More fundamental: lack of awareness, legal frameworks, funding, and supply chains
Cross-Sector Collaboration	Strong partnerships with education and industry actors, especially in circular pilot projects	Mostly informal or absent, driven by external donors or NGOs
Readiness for Pilots	High – ready for experimentation and replication	Moderate to high interest, but require technical assistance and capacity building

Comparative analysis: business sector focus groups

Dimension	Slovenia & Netherlands	WB Countries (Albania, BiH, Montenegro)
CE Awareness & Practice	70–80% of companies are familiar with CE; CE integrated in design, material use, and waste management	Limited knowledge of CE; adoption often indirect or donor-driven; BiH slightly ahead with a few exporters integrating CE methods
Technology Use	Common use of CNC, ERP, CAD/CAM, modular systems	Partial digitization; most SMEs in WB operate manual or semi-mechanized lines; new technology is imported and underutilized
Sustainable Design	Focus on lifecycle durability, modularity, and recyclability; strong B2B and public demand for sustainable furniture	Low demand, weak product standardization, limited access to green materials; sustainability viewed as secondary
Barriers	Supply chain transparency and circular product certification costs	Core challenges: financial resources, lack of CE regulation, and limited skilled labor
Interest in Pilots	High – especially for product innovation and tracking systems	Present, but contingent on infrastructure and guidance from EU partners

Comparative analysis: VET sector focus groups

Dimension	Slovenia & Netherlands	WB Countries (Albania, BiH, Montenegro)
Curriculum Integration	30–40% have fully embedded circular economy topics; others follow via project-based learning	CE concepts are emerging, mostly through pilot projects; not yet formalized in curricula
Collaboration with Industry	60–70% of institutions maintain active ties with sustainable companies for internships and labs	Collaboration limited to ad hoc placements or donor-funded projects; systemic alignment is missing
Teacher Training	Upskilling pathways (e.g., "Train the Trainer", CoVEs) exist	Widespread gaps in digital, CE, and eco-design competencies; teachers lack access to industry trends
Facilities & Tools	Well-equipped labs with CNC, AR/VR, material libraries	Schools lack basic CNC tools, testing equipment, and updated learning materials
Student Preparation	EU VET schools offer applied knowledge in lifecycle assessment, modular furniture, and sustainable design	WB schools focus on traditional carpentry, with limited exposure to CE practices

Annexure I – Focus group questionnaires

Public sector template

General Information

1. What is the role of your organization in the furniture sector? *(e.g., regulation, waste management, support for businesses, procurement, etc.)*
2. What policies, programs, or initiatives related to the furniture sector does your institution currently have in place? *(Please describe any relevant actions, including sustainability programs, circular economy initiatives, or procurement policies.)*

Current Practices and Challenges

3. How does your institution handle end-of-life furniture? *(e.g., disposal, recycling, donation programs, partnerships with reuse organizations, etc.)*
4. What are the biggest challenges your institution faces in relation to the furniture sector? *(e.g., waste management, supply chain issues, sustainability, lack of regulations, public engagement, etc.)*
5. Does your institution collaborate with other public or private sector actors in the furniture industry? *(If yes, please specify the type of collaborations.)*

Sustainability and Circular Economy

6. To what extent is sustainability a priority in your institution's approach to furniture procurement and management? *(e.g., use of recycled materials, eco-friendly design, repair and reuse policies, etc.)*
7. Are there any incentives or support mechanisms in place to encourage furniture reuse, refurbishment, or recycling? *(If yes, please describe them.)*

Future Perspectives

8. What changes or improvements would you like to see in the public sector's involvement in the furniture industry? *(e.g., new policies, better infrastructure, increased funding, improved partnerships, etc.)*
9. Are there specific regulations or policy gaps that need to be addressed to improve the sustainability and efficiency of the furniture sector? *(If yes, please elaborate.)*
10. Would your institution be open to participating in pilot projects or initiatives focused on sustainable furniture practices? *(If yes, what kind of initiatives would interest you the most?)*

Business sector template

1. Which company do you work for?
   ……..
2. What is the main product produced by the company you work for?
   ……
3. Are you familiar with the circular economy model?
- Yes
- No
- I have heard about it, but I don't know what it is

4. Have you been informed by the company you work for about the circular economy model?
- Yes
- No

5. If yes, in what way?
- Collaborating with a waste management company
- Utilizing them to produce raw materials that will be reintroduced into the product production line
- Other……

6. Is there a possibility of extending the lifecycle of the company's products through?
- Reuse
- Repair
- Recycle packaging

7. The company you work for during the design of a product focuses:
- In the selection of sustainable packaging (e.g., recyclable, made from bioplastics, reusable, packaging made from recycled paper or cardboard)
- Finding a production process with a minimal energy footprint (its goal is to reduce electricity and water consumption)
- All the individual raw materials/parts of the product should be able to be reused/recycled
- Other ……

8. If you were a member of a product development team, would you choose raw materials that come from waste processing?
- Yes
- No
- Maybe

9. Do you believe that the company you work for could adapt to the new consumption standards?
- Yes
- No
- Maybe

10. Do you consider a product with sustainable features competitive?
- Yes
- No
- Maybe

11. Do you believe that consumers in your country are positively inclined towards these products?
- Yes
- No

12. Do you buy back/return your products?
    - Yes
    - No

1. If the answer to the previous question is YES, please explain what you do with the old furniture.

……..

13. Do you use technologies in your production processes that contribute to reducing energy consumption (new machinery, software, indicators for optimization and monitoring of production processes, AI, etc)?
    - Yes
    - No

1. If the answer is yes, please specify which technologies you use, for which processes, what they enable you to do, the savings they provide, and the name of the technology/software provider

……

14. Do you use technologies in your production processes that contribute to reducing waste generation and optimal resource utilization (new machines, software for production monitoring, product design software, AI, etc.…)?
    - Yes
    - No

1. If you use them, please specify which technologies you use, for which processes, the savings they provide, and the name of the technology/software provider.

……..

15. What motivated the company you work for to follow the principles of the circular economy in product development (if applicable)?
    - The legislation
    - The competition
    - The innovation
    - I don’t know

VET sector template

General Information

1. What type of VET institution do you represent? (e.g., technical school, vocational college, apprenticeship, etc.)
2. What are the main fields of study/training offered at your institution?
3. What level of education a person reaches after leaving school?

Sustainability & Furniture Sector

4. How does your institution currently integrate sustainability concepts into its curriculum, particularly in relation to the furniture sector?
5. What are the biggest challenges your institution faces in incorporating sustainable practices into VET programs?
6. Are there any partnerships or collaborations with industries focused on sustainable furniture manufacturing? (Yes/No, please elaborate)

Wood Recycling & Reuse of Furniture

7. Does your institution provide training on wood recycling and the reuse of wood products and furniture? (Yes/No, please elaborate)
8. If yes, what specific topics related to wood recycling and reuse are covered in the curriculum? (e.g., repurposing old furniture, circular economy principles, waste reduction strategies, etc.)
9. What are the main barriers preventing wider adoption of wood recycling and reuse practices in vocational training?

Training & Skills Development

10. What specific skills do you believe are most needed for VET students to work in the sustainable furniture industry?
11. Do you think there is sufficient training material available on wood recycling, reuse, and sustainability in the furniture sector for VET students? (Yes/No, please explain)

Future Needs & Expectations

12. What type of resources or support would help your institution enhance sustainability-related training in vocational education?
13. In your opinion, what should be the main priorities for improving sustainability education in VET institutions?
14. Would your institution be interested in participating in pilot training programs or testing new educational materials developed under the SUSFUR project? (Yes/No, comments)

Reference documents

Slovenia

- Slovenian Circular Economy Roadmap (SRIP Circular Economy)
- SRIP Smart Buildings and Wood Chain – Strategic development framework for wood and furniture industries
- Action Plan for Measures to Develop the Wood-Processing Industry until 2030
- SURS – Statistical Office of Slovenia: Data on employment, industry performance, and vocational outcomes
- CPU – Center for Reuse Slovenia: Reuse infrastructure data and operational models

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Netherlands

- "Nederland Circular in 2050" – National Circular Economy Strategy
- RVO – Netherlands Enterprise Agency: Circular procurement instruments and innovation support
- CBS – Statistics Netherlands: Sectoral data on wood imports, exports, and employment
- TNO – Netherlands Organization for Applied Scientific Research: Applied policy studies and CE implementation guidance

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Albania

- National Strategy for Waste Management (Draft Circular Economy Roadmap)
- Law No. 10463/2011 "On Integrated Waste Management"
- Law No. 10431/2011 "On Environmental Protection"
- DCM No. 402/2021 – National Waste Classification Catalogue
- INSTAT – Albanian Institute of Statistics: Demographic and sectorial indicators
- Albanian Environment Agency (2021) – Waste management coverage, infrastructure, and fees
- Eunomia et al., 2017 – Waste treatment and landfill capacity assessments

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Bosnia and Herzegovina

- National Environmental Protection Strategy
- Infokom-91, Foreign Trade Chamber of BiH (2025) – Waste management performance data
- Sectoral strategies of entity-level ministries for wood processing and industry development
- UNIDO Pilot Training (via Faculty of Forestry Sciences, funded by Slovenia) – Circular economy capacity-building reference

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Montenegro

- National Waste Management Strategy and Circular Economy Framework
- MONSTAT – Statistical Office of Montenegro: Forest coverage and sector classification data
- Development Program for Wood Processing and Furniture Production 2025–2028
- Industrial Policy 2024–2028 – National modernization and CE transition framework
- Applied Sciences Journal – Sectoral studies on CAD, scanning technologies, and digital tool integration