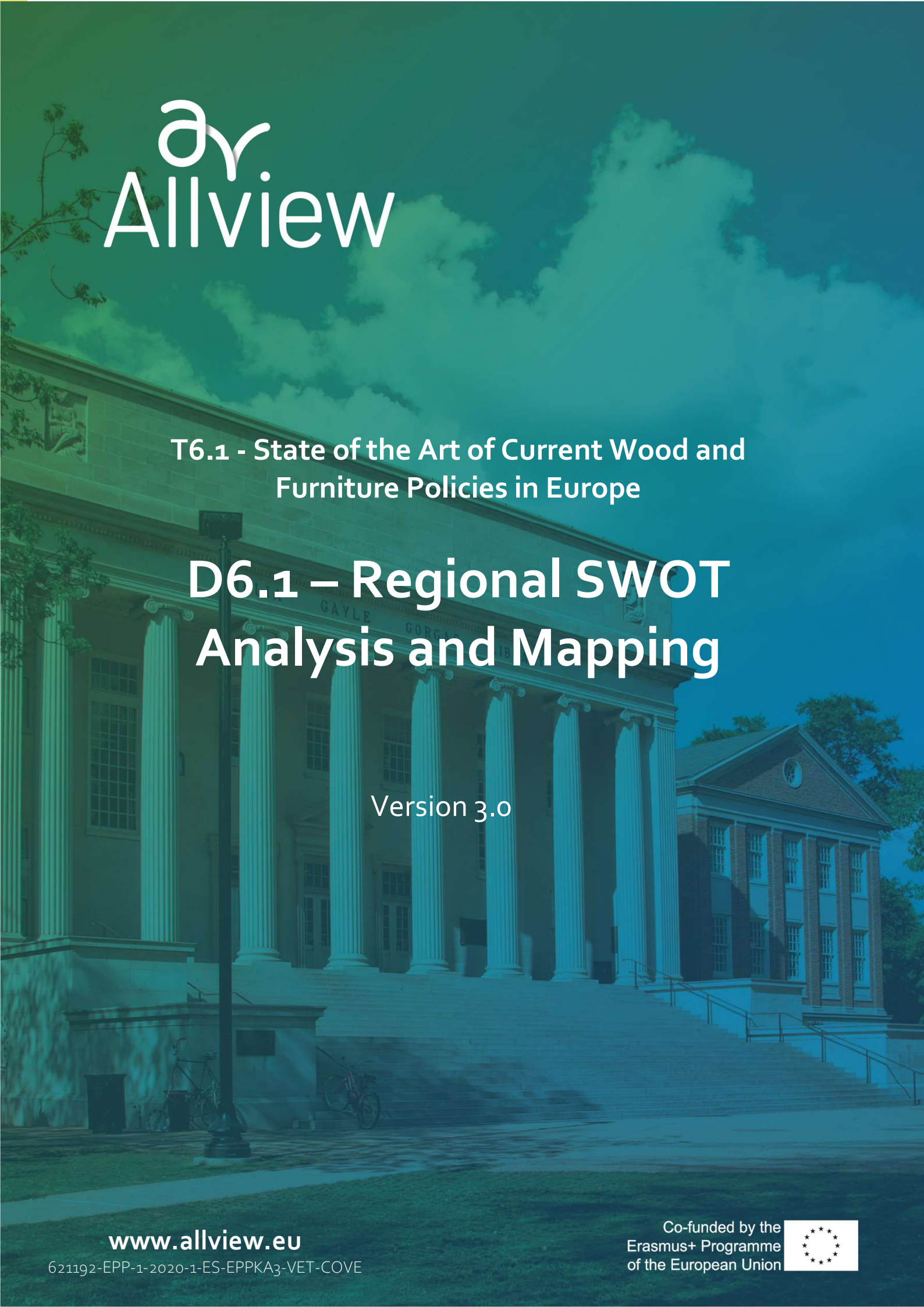

Allview

T6.1 - State of the Art of Current Wood and Furniture Policies in Europe

D6.1 – Regional SWOT Analysis and Mapping

Version 3.0

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Introduction

1. Introduction

Objective of the document

The purpose of this document is to assemble information regarding the state of the Wood and Furniture sector (W&F) in each region so that a common understanding of the industrial context as well as of educational gaps and skills demand can be established following data collected from Regional Stakeholder Groups. Ultimately, the knowledge on the state of the W&F sector is used to develop updated curricula in each region with reference to the thematic areas of the ALLVIEW project i.e. Industry 4.0, Ambient Assisted Living, and Corporate Social Responsibility.

This document summarises the activities carried out under *T6.1 State of the art of Current Wood and Furniture policies in Europe* under *WP6 Blue Print in the W&F sector*.
To put together the information below, members of the consortium of *ALLVIEW* from each region/country of the project drew on their extensive experience with stakeholders in the W&F industry, alongside consultation with said stakeholders and desk research.
By doing this they were able to do three main things:

- map out relevant stakeholders in the industrial sector in the single regions;
- assess the Strengths and Weaknesses of, as well as the Opportunities and Threats facing their region nowadays;
- conclude with an outline of the state of the art and some possible forecast in their region.

The stakeholder mapping will prove beneficial further on in the project as it will provide an easy-to-refer-to guide to the important players in the W&F educational key players in their region. It thus provides a guide to who may be invited to take part in their Regional Stakeholder Groups, who will be able to provide validation feedback on project deliverables, to validate the new curricula developed in WP6, and further items.

The SWOT analyses, on the other hand, provide insight into what the prevailing situation in each region is: in which ways the local W&F sector is doing well (Strengths), in what ways it is performing poorly (Weaknesses), which external conditions promise to help the industry (Opportunities), and which external conditions may cause setbacks to it (Threats). This is rounded off with a comparison of the internal aspects (Strengths and Weaknesses) and external aspects (Opportunities and Threats) in order to show up similarities and differences between the situations in each partner region/country. The SWOT analyses are done on the basis of either the entire national context (i.e. Poland) or the context of the region the contributing partner is based and works in (i.e. Flanders, Belgium) according to the scope of work of the contributing partners and what they felt they could best provide accurate knowledge about.

Following those comparisons, this document continues with a series of desk research carried out into 7 other non-project countries, in order to gain a broader look at the W&F industry across the EU. This desk research focuses on the 3 thematic areas of the project – Industry 4.0/Digitalisation, Ambient Assisted Living, and Circular Economy/Corporate Social Responsibility – as well as a look into existing education pathways into the W&F industry in each of the countries included.

Lastly, some conclusion is drawn to wrap up all of the findings above.

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Findings in partner countries

2. Findings in partner countries

Spain

Mapping

In bold, the participants involved in SWOT analysis.

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
	Include name of institution as well as competencies and responsibilities					
High Influence/ High Impact	Consejería Educación (Ministry of education in Murcia Region) **SEF Murcia Region Employment office** INFO (Development Agency of the Region of Murcia)				UPCT (Technical University of Cartagena)	
High Influence/ Low Impact						
Low Influence/ High Impact		AREMA (Region of Murcia Furniture Manufacturers Association) **AMUEBLA (Innovative business association of furniture manufacturers and related in the Murcia Region)** CEEIM (Murcia European Business and Innovation Center)	PROFEMADERA (Spanish VET Teachers of furniture and wood association)	CETEM (Technological Research Centre of Furniture and Wood)	IES Castillo Puche (i-VET in Carpentry for EQF 3,4 and 5)	CEPAIM, NGO dealing with social inclusion in various fields in several regions

Low Influence/ Low Impact						Cáritas (NGO) deals with workshops for migrants in textile and upholstery

SWOT

The analysis has been performed by the four full partners of the Region of Murcia: CETEM R&D centre, Amuebla cluster, Technical University of Cartagena (UPCT) and the Regional Employment office (VET authority). Furthermore, teachers of the main i-VET school related with the sector (EQF3,4 and 5) High School J.L Castillo Puche [1] were interviewed. Those teachers are part of the national network of VET teachers PROFEMADERA [2].

For the future constitution of the stakeholders' group, it is foreseen to invite as well to the associated partner AREMA [3] which represents the manufacturers in the region and the ministry of education of the region (i-VET authority). Furthermore, schools and NGOs (e.g., CEPAIM [4]), with experience in special education and integration of people with risk of inclusion and migrants will be invited as well.

The approach of the exercise was to understand the strengths, weaknesses, opportunities and threats of the education of F&W in order to develop a blueprint for VET at regional level that could also be taken at national level. The reference is the Centres of Vocational Excellence (CoVE's) philosophy of the EUROPEAN SKILLS AGENDA FOR SUSTAINABLE COMPETITIVENESS, SOCIAL FAIRNESS AND RESILIENCE (SKILLING FOR A JOB: ALIGNING POLICIES TO DELIVER RESULTS).

ALLVIEW aims to involve the necessary stakeholders to ensure the impact and sustainability of the suggested policies which will have the challenge to align the training with the market needs, to be digital, green and inclusive. For that aim, the SWOT analysis has been divided in 4 subsections:

1. Situation of the Panorama of education related to F&W (Including dual training).
2. DT and Industry 4.0 related to the sector including training and industry.
3. CE and other environment protection related to the sector including training and industry.
4. How the sector is dealing with SI

1 http://www.iescastillopuche.net/
2 http://www.profemadera.es/
3 https://www.arema.es/
4 http://cepaim.org/

	Strengths	Weaknesses
Internal	**Education in F&W in Murcia Region**	
	Previous work / courses in DT, CE and SI of the partners of ALLVIEW. c-VET and i-VET authorities or regional business association are full partner or associated partner of this consortium. The main Technical University in the region is our full partner. ALLVIEW is the first CoVE in Murcia Region. CoVEs will be a priority until 2027 for the EC and are included in the EU skills agenda. c-VET by CETEM aligned with innovation and business. Castillo Puche (i-VET school) is teaching 1 of the 2 online courses in Spain. For that Castillo Puche School has worked sensitively well in online mode during pandemic.	Difficulty to engage enterprises / Dual Learning works better with large enterprises while in the national panorama are mostly SMEs. At this stage no dual learning is deployed. Specific Skills Alignment (DT or CE) in i-VET with business needs is low. There is a range of improvement in workshops for practical training in c-VET and an absolute lack of open spaces for co-development in line with the FabLabs philosophy. Lack of agreements with private technology providers for licenses or specific training. Skills competitions and mobility actions produced great feedback to teachers in the past. Currently there are no regular activities in that sense (after 2012).
	Industry, Research, and training / Circular Economy in Murcia Region	
	High research capacity. Access to an enormous amount of open information on CE. Experience of habitat-related actors Strong awareness towards the potential of CE, especially among the new generations. Sectors with a strong focus on green growth and renewable energy such as the furniture and wood industry. New economic, productive and consumer models. Train expert professionals, capable of giving concrete and measurable answers to companies that see sustainable development as an opportunity, and that want to innovate, taking advantage of the possibilities offered by the CE as a competitive advantage.	It is necessary to adapt training to these new needs. Knowledge and skill gaps. There is a need to adapt curricula, training courses and upgrade the qualifications of those already employed. Companies and their shareholders have to prepare and train themselves professionally to implement criteria that consumers and their employees are already demanding.
	Industry, Research and VET/HE training / Digital Transformation in Murcia Region	
	Previous work / project/ courses of DT and Industry 4.0, developed/trained/leaded by partners of ALLVIEW. Official VET/HE degrees in the framework of DT and Industry 4.0 in VET/HE institutions of the Murcia Region.	Just a few consolidated relationships between VET and HE institutions to promote DT/Industry 4.0 in their students/degrees. No remarkable use cases of Learning/Teaching factories (LT/TF) where students/employees could experience the DT/Industry 4.0 in real factories/enterprises.

	In the last years, numerous workshops, events, campaigns and investments to stimulate and boost the Innovation in the framework of DT in Murcia Industry (e.g., strategy Murcia Industria 4.0 [5]). Strong relationship between Enterprise Public/Private authorities and HE/Research institutions, all together promoting strategies and tools for boosting smart specialization and to encourage the implementation of Industry 4.0. Increase of SME with expertise in Industry 4.0 and DT, to support/offer solutions in the framework of smart factories/smart enterprises. New economic, productive and consumer models.	Not sufficient campaigns in Murcia Region, promoted by Industry and research, to transmit and convince about the benefits of DT to managers/employees in the F&W sectors and others with impact in the economy of Murcia Region. Not sufficient VET/HE degrees in Murcia Region focused on the F&W sector with innovation in the framework of DT/ Industry 4.0. Knowledge and skill gaps. There is a need to adapt curricula, training courses and upgrade the qualifications of those already employed.
	Social Inclusion in VET	
	Specific programmes for vulnerable groups in a situation of unemployment to improve their employability and provide them with more job opportunities. Collaborating entities that are non-profit organizations that work with groups in a situation of vulnerability and know first-hand the most appropriate training or employment niches for these groups. Employment counsellors and non-profit organisations are asked through questionnaires what, in their opinion, are the training needs most relevant to improve the employability of these groups.	Social Inclusion is not included in the regular official curricula. There is a range of improvement in c-VET (adults) in related sectors for disadvantaged backgrounds (migrants, social problems, ...) Many people within these groups cannot follow long training courses, as they need to be employed. Not all courses are scheduled due to lack of funds. Knowledge and skill gaps. There is a need to adapt curricula, training courses and upgrade the qualifications of those already employed.
External	Opportunities	Threats
	Education in F&W in Murcia Region	
	High demand of skilled professionals. Alignment with EU and NATIONAL policies. Very good examples of innovative enterprises dealing with DT, CE and SI. RIS3 target habitat sector including furniture and construction. Need of DT, CE and SI training in most of the i-VET schools. Strong potential transferability to other sectors. Need of Quality Assurance framework or institution of Vocational Excellence in the Region (also threats). Broad range of EU courses to upskills the teachers (DT, SI, CE). Use AI to connect companies, job demanders / students and training providers.	Reputation of T-VET is still low for society. COVEs philosophy is not well known. Low resources of public schools / Facilities and machinery of i-VET schools out of date. There is no public Regional centre for innovation in VET. Innovative enterprises exit but are not the majority. Political situation is not very stable. Only 2 i-VET centres in F&W in the region. Furniture enterprises are not homogeneous distributed in the region and concentrated in Yecla. Proper wood/forestry sector (raw material) is not as strong as furniture. Teachers are not receiving official support for up-skilling.

5 http://www.murciaindustria40.es/murciaindustria40-app/

	Strong links with PROFEMADERA the national association of VET teachers in wood sector.	There are no agreements of collaboration with technology providers and only a few in the past with private institutions (AREMA, CETEM, some companies).
	Industry, Research and training / Circular Economy in Murcia Region	
	Creation of new jobs, and the improvement of existing ones, within the framework offered by the CE. High potential of collaboration of actors from different sectors (agrifood, construction, etc). Paradigm change with an Action plan to support and promote the transition process towards a CE. In terms of environmental protection, the basic legislation corresponds to the Spanish State, the rest is the responsibility of the Autonomous Communities that have it transferred. National economic instruments and different benefits or economic incentives that promote the CE and Industrial Symbiosis in organisations. Some of the Spanish CE and Industrial Symbiosis policies are aligned with European strategies.	The debate on CE began years later if compared with other Spanish regions or territories. The state of the art of this legislation is still to come and therefore, to be passed and implemented. No explicit strategy to support CE education and training at regional level.
	Industry, Research and VET/HE training / Digital Transformation in Murcia Region	
	Growing and vibrant I4.0 Ecosystem in Murcia Region. We can boost the c-VET with a strong branch in DT/Industry 4.0 New degrees in VET/HE in the wood and furniture sector with strong competencies and knowledge in DT. New relationships between VETs and HE to take the latter as bridges between VET and enterprises. To promote financial support from public authorities to support research and innovation in DT in Murcia Region from the three levels: education (VET/HE/c-VET/adults-training/continuous training/training for employees), Research and development (R&D) and factories/enterprises.	Not clear strategy for increasing relationships between VET and HE in the promotion of DT/Industry 4.0 in their students/degrees. Not enough financial support for enterprises that want to lead Learning/Teaching factories (LT/TF) with a framework in DT/Industry 4.0. Not enough financial/strategies/policies support to relationship and innovation between Industry and HE/Research centers. Not enough authorities support for boosting new degrees in VET/HE in Wood and Furniture sectors with strong branch in DT.
	Social Inclusion in VET	
	Experience in social inclusion: a) The NGO Cáritas Cartagena has some previous experience in workshops for	Very low resources for workshops for c-VET of migrants. Slowness in the payment of the recognized scholarships.

	disadvantaged backgrounds adults in Textile and Furniture b) Special Education school (Stmo. Cristo de la Misericordia) is teaching the EQF3 i-VET course. Recognition of social inclusion in most budget lines for the employment training grant. Inclusion of aid for training that includes scholarships for transport, assistance or maintenance in the event of unemployment of the user.	

Outline Analysis

Strengths:

One of the strong points of our blueprint will be the commitment of all the stakeholders of the furniture and wood and educational panorama in Murcia Region since all of them are full or associated partners of this CoVE. They represent R&D, VET, HE, Enterprises of the sector and policy makers. All the full partners have previous experience in common projects/work/studies related to Digital Transformation/ Industry 4.0 (*6*), Circular Economy / Eco-design (7) or Social Inclusion. ALLVIEW is the first CoVE initiative coordinated by an organization of the Region of Murcia (a second in Spain) and participated by other three. It should be an advantage when designing and advising the authorities in the topic.

Related to Circular Economy, ALLVEW regional partners has a high research capacity and access to a substantial amount of open information due to a proven experience on the habitat sector.
There are previous work/project /courses of Digital Transformation and Industry 4.0, developed/trained/leaded by partners of ALLVIEW. Moreover, we can find official c-VET/HE degrees in the framework of Digital Transformation and Industry 4.0 in VET/HE institutions of the Murcia Region. During the last years, numerous workshops, events, campaigns, and investments to stimulate Digital Transformation in Murcia Industry has been performed at institutional level. There is an already created ecosystem of public institutions and private enterprises along with R&D institutions promoting smart specialization and technology start-ups .
Related to social inclusion we can find already existing programmes by SEF for vulnerable groups to boost employability (not necessary with the sector).

Weaknesses

The main weakness at educational level is the fact that dual training is not currently established in the regional i-VET school in our sector. It is because dual training and apprenticeships has not a strong tradition in Spain. Specially in the F&W sector has been difficult to engage the enterprises, most of them are SMEs, which (among other problems) face higher expenditure per trainee than large employers (*8*).

The specific skills alignment, about green and digital topics, in i-VET with business needs is very low. There is a range of improvement in workshops or learning factories for practical training in c-VET and an absolute lack of open spaces for co-development in line with the FabLabs philosophy. Moreover, we have not found relevant agreements with private technology providers.

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6 IN4WOOD, Making4.0, DITRAMA
7 *ECOSIGN* , Furn360, Design4Circle
8 Not all firms are created equal: SMEs and vocational training in the UK, Italy, and Germany - Benassi, Chiara; Durazzi, Niccolo; Fortwengel, Johann

Finally, before 2012, skills competitions and mobility actions were a great source of information for i-VET teachers. There is no current institutional support for them to participate in such activities.
Related to digital transformation, there are not sufficient campaigns promoting their benefits and impact in the economy. Moreover, the official degrees related with the Furniture sector in the framework of Industry 4.0 are not enough.
No topics about social Inclusion or Corporate Social Responsibility are included in the regular official curricula and c-VET courses for managers are difficult to find. The offer of courses targeting adults with disadvantaged backgrounds (migrants, social problems, ...) is poor or just not scheduled due to the lack of funds.

Opportunities

Within the opportunities that have been detected at regional level, we can highlight the high demand of skilled professionals. Moreover, we can find very good examples of innovative enterprises dealing with CE, DT and SI, with strong potential to transfer their good practices to other sectors.

There is a clear alignment of the RIS3 and some CoVE priorities with our sector. Definitively, there is an important opportunity to include topics about DT, CE and SI in the i-VET curricula. There are broad variety of EU open courses and curricula coming from Erasmus+ projects to support the schools and VET authorities in that sense. We believe that this process needs to be supported by a Quality Assurance framework or Institution of Vocational Excellence in the Region.

Related to CE, it is a topic that raise awareness in the society, especially with new generations and with the potential of creating new jobs since the F&W sector has a strong focus on green growth and renewable energy. Moreover, there are potential symbiosis with others strong regional sectors such as agri-food9 or construction. CE and industrial symbiosis are supported in different ways by the Spanish government and European Commission.

In Murcia Region there is a vibrant and growing Industry 4.0 ecosystem that can support the digital transformation of enterprises of the sector and boost c-VET. Moreover, new degrees in VET/HE in the wood and furniture sector with strong competencies and knowledge in digital transformation could be created. Those degrees must boost relationships between VET and HE to take the latter as bridges between VET and enterprises. It should promote financial support from public authorities to boost research and innovation in DT from the three levels: education (VET/HE/c-VET/adults-training/continuous training/training for employees), Research and development (R&D) and factories/enterprises.

On the other hand, we cannot lose the opportunity of using Artificial Intelligence to connect companies, job demanders / students and training providers. This is one of the expected results of this project.

There are very important opportunities related to SI in the F&W sector where we have found already existing private and public initiatives targeting special education in i-VET or integration of disadvantage backgrounds and migrants in c-VET

Threats

Amongst the different threats, that face our region related to the education in the F&W sector, we can highlight the low resources of the only two public schools along with the obsolete workshops and their machinery. Moreover, their teachers are not receiving official support for up-skilling in the form of courses.

9 AGROMAT is an R&D project about how to re-use the subproducts from agriculture (artichoke) into PU foams http://www.cetem.es/proyectos/i/2171/321/proyecto-agromat

The reputation of T-VET is still low in our society. We think that it can be amended with strong dissemination of the CoVE philosophy among the general public and with the creation of a regional centre for innovation in VET such as exist in other Spanish regions to support T-VET institutions.
Also, we believe that there is a challenge to improve the collaborations with technology providers and private institutions (e.g., CETEM, AREMA, Enterprises, ...)

When talking about CE, the debate has come years later to the Region of Murcia in comparison with other territories. Actually, there is no explicit strategy to support CE at training level.

We cannot find a clear strategy for increasing the relationships between VET and HE in the promotion of Digital Transformation/Industry 4.0 in their students/degrees. And there is a range of improvement in financial/strategies/policies to support the relationship and innovation between Industry and HE/Research centres. It would help to have new degrees in VET/HE in Wood and Furniture sectors with strong branch in digital transformation.

For social inclusion we have detected that there are very low resources for c-VET of disadvantages backgrounds such as migrants that could join the labour market with specific training.

Poland

Mapping

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
	Include name of institution as well as competencies and responsibilities.					
High Influence/ High Impact	Ministry of Economic Development, Labour and Technology Competencies: - Industry and trade development. - Industrial Politics: competitiveness innovation and industrial research, technology transfer, patents and trademarks, funds and concessions.	Polish Chamber of Commerce of Furniture Manufacturers Competencies: - Integration of the Polish furniture sector in order to effective participation in the formation of the development of the Polish furniture sector, active promotion of the Polish furniture in the country and abroad. -Supporting of endeavours to warrant consumers full satisfaction of the buying and using of the Polish furniture goods.		Ministry of Education and Science Competencies: -High education realisation -Curricula definition. The National Centre for Research and Development -Definition of the national research plan - Research funding, including transfer science to business	Warsaw University of Life Science – SGGW Poznań Univeristy of Life Sciences Competencies: -General Management of the Italian Education and Training System -VET -Primary, secondary, superior and professional qualification -Curricula definition	
High Influence/ Low Impact		Association of Foresters and Wood Technologists Competencies: -Institutional relationship -Lobbying and advocacy -Sectoral capacity building -Technical-regulatory lobbying -Promotion and support of the Italian wood-furniture sector				

Low Influence/ High Impact					Łukasiewicz Research Network - Wood Technology Institute Competencies: - Manner with theoretical and practical issues of wood processing, its application and creation of new composites based on wood.	
Low Influence/ Low Impact		Chief Technical Organization Competencies: - strengthening the role of scientific and technical associations and the federation in society and the state in the face of the fourth industrial revolution (INDUSTRIA 4.0)		The National Science Centre Competencies: - Financing research projects.		

SWOT

	Strengths	Weaknesses
Internal	Education in F&W	
	Excellent teaching staff, closely cooperating with the industry. Organization of professional practice. In case of large companies, the relation with the academic world and research community is regular and open for innovation.	The relationship with the academic world and research community is irregular and far from open innovation models in case of small enterprises. The need for distance learning during a pandemic without sufficient preparation.
	Industry, Research and VET/HE training / Digital Transformation	
	Highly qualified and experienced employees. A long-term contracts signed with domestic and foreign contractors. World's leader in terms of furniture production (6th position globally and 3rd in Europe) and wood-based panel manufacturing (7th largest global producer and 2nd European). Possessing of a quality certificate for the wooden products used as construction materials.	Most businesses are family-owned, with little inclination to draw on external managerial expertise. High share of fixed costs - insurance, energy, fuels in the price of products. The need to modernize the production hall for new technological devices, the need to modernize the energy (electrical) system, too large stocks of sawn timber and coniferous square timber. Significant inflation and the need for systematic wage increases, burden of repayment of the loan taken out

		for part of the investment. Huge diversification of enterprises: the high number of highly specialised micro and small enterprises weakens the ability to create a system and implement strategic actions (few joint stock companies). Highly diversified level of technological and digital maturity and still underdeveloped use of customer-facing technologies and market approach. Fragmented, traditional, non-innovative sector distribution.
	Social Inclusion	
	Stimulating to local development and entrepreneurship, primarily in less-developed regions	
External	Opportunities	Threats
	Education in F&W	
	Train expert professionals, capable of giving concrete and measurable answers to companies that see sustainable development as an opportunity, and that want to innovate, taking advantage of the possibilities offered by the circular economy as a competitive advantage.	Overloading teachers with organizational duties. This makes it impossible to focus on the teaching process.
	Industry, Research and VET/HE training / Digital Transformation	
	Possibility of getting money from the EU funds. Great interest of foreign and domestic contractors in timbers made of exotic wood,or larch. The excess of skilled labour in the region. Great interest and significant sales of timbers inBaltic countries and Russia. Possibility to increase sales by national agents and TV advertising. Well-organized system ofinformation- flow and system of threat monitoring	National economic recession. Increase in prices ofsawmill and imported materials. Competition in the marketsof EU from South American countries in the area of sawmillmaterials. Knowledge and skill gaps. There is a need to adapt curricula, training courses and upgrade the qualifications of those already employed. Production of joinery from aluminium and PCV. Decline in the product prices on domestic and foreign markets. Increase in fixed costs in the product price, the need to reduce the profit rate.

Outline Analysis

Poland belongs to the group of countries characterised by the largest share of forested areas, covering 30% of the country's territory. Wood is a strategic natural resource in Poland and the forestry-wood sector is an economy flagship, frequently described as a "Polish intelligent specialization" – a priority area in terms

of economic and scientific potential. Poland's forestry and raw material resources are considerable on a European and global scale. Its large area of forests (7th place in the European Union), rich raw material base (4th place) and a relatively large wood production volume (5th place) – all put Poland among the major producers of not only the European, but also the global wood market. Last but not least, Polish forestry is held in high esteem in Europe for the sustainable use and rational management of its resources.

The development potential of the Polish forestry-wood sector is reflected by its strong position among the biggest players in Europe and across the world with regards wood product manufacturing. Poland is one of the world's leaders in terms of furniture production (6th position globally and 3rd in Europe) and wood-based panel manufacturing (7th largest global producer and 2nd European). The production potential of the forestry-wood sector also allows effective expansion on the international markets. Poland's furniture exports account for 6% of the world's furniture exports (4th place in the world and 3rd in the European Union). Within Europe, Poland is a major exporter of fibreboard, mainly wet-process porous board (1st place). The wood sector, i.e. wood processing-based industries, is an important element of the Polish economy with a 2% share of GDP, 3.3% of global production of Poland, and a 2.2% of gross added value (2015-2016). The sector represents more than 62,000 business entities, mainly small and very small wood companies (92% – especially in the sawmilling and furniture industries). The forestry-wood sector in Poland is also of great social importance as a stimulus to local development and entrepreneurship, primarily in less-developed regions.

The extremely diverse Polish wood sector generates 9% of the value of commercial production and creates 12% of jobs in industry as a whole. The furniture industry, often called a driver of Poland's economic development, is a flagship industry representing 35% of commercial production, 49% of employment, and 41% of business entities. In fact, furniture-making has been granted the status of a national "industrial specialization" and stands out among the national industries that have already become or may become leaders in the global market. In terms of its development, the wood sector, as well as the Polish economy, relies largely on industries such as pulp and paper, paper processing, wood-based panels and carpentry and joinery for buildings. The wood and furniture industry in Poland is one of the fastest growing sector of the Polish economy and the sector is growing five times faster than in the rest of the EU. It gives more than 65 thousand entities and about 256 thousand employees. The wood sector is one of the few in Poland that has been characterized by a positive trade balance for many years, thus mitigating Poland's foreign trade deficit. The sector's share of national exports is 9% and imports is 4% (2015-2016), while around 70% of wood is exported in the form of high value-added products, where furniture is one of the major commodity groups (with a 5% share in total value of Polish exports). Poland's foreign trade in wood and wood products is focused on the European market, which receives 83% of Polish wood and wood products, while at the same time almost 82% of wood and wood products imported to Poland come from the European Union. The industry is characterized by a large number of entities of various sizes. There as domination of small businesses (often family businesses).

Belgium

Mapping

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
High Influence/ High Impact	Public employment Services VDAB (Flanders) Forem (Walloon Region) Competencies: - Regional policies for the unemployed and for the labour market - Training of unemployed - Support for companies when engaging unemployed - Regional, specific premiums and subsidiary help Ministries and ministerial cabinets Ministry of Education Ministry of Work Competencies: - Policies and Politics	National sectoral Business Associations (W&F) Fedustria (wood and furniture industry) Houtunie (furniture smaller companies) Belgische Houtconfederatie (wood sector, logging, sawmills and wood and panel trade/import) Competencies: - Institutional Relationship - Lobbying and advocacy - Capacity building - Technical-regulatory lobbying - Promotion and support of the Belgian Wood and Furniture sector - Networking and info dissemination	National sectoral Trade Unions (W&F) ACV BIE AC ABVV ACLVB Competencies: - Lobbying and advocacy - Networking and info dissemination among members	Research centers W&F Wood.be (wood and furniture) WTCB / CSTC (construction, including wood) Competencies: - Research and Innovation - Laboratory Test - Product Certification - Technical-regulations	Educational networks KOV (catholic schools) OVSG (municipal schools) POV (provincial schools) GO! (public schools) 4 official networks of educational institutes Competencies: - Vocational, Education and Training - Definition and Update of the Curricula VLOR: Flemish Educational Council National sectoral Training Centre (W&F) WOODWIZE Competencies: - Implementation of (regional) policies on VET and CVET, non-discrimination and inclusion, Health and Safety in W&F - Definition and Update of the Curricula and sectoral qualification profiles - Networking with the local business environment (paritairy) - Continuous Professional	Employers W&F (individual) - Branding - Engaging people + choice of CVET / professional development of workers - Choice of machines, products, markets... SERV (Flemish social economic advisory council) Competencies: - Lobbying and advocacy - Policies

					Development -Vocational, Education and Training	
High Influence/ Low Impact		European sectoral Business Associations (W&F) EFIC (furniture sector) EPF (wood panels) EOS (sawmills) CEI Bois (wood industry) etc... Competencies: - Lobbying and advocacy - Networking and info dissemination among National Associations - Technical-regulatory lobbying - Institutional Relationship with EU		European sectoral Unions Associations (W&F) EFBWW (European Federation of Building and Wood Workers) Competencies: - Lobbying and Advocacy - Institutional Relationship -Transversal Sectoral Projects		
Low Influence/ High Impact	Ministries and cabinets Ministry of Social affairs Ministry of social economy Ministry of Research and Innovation Ministry of Forestry (under Agriculture) Competencies: - Policies and Politics	National and regional business associations VOKA (Flanders, bigger companies) UNIZO (Flanders, small companies and independent workers) UWE (Walloon region, bigger companies) VBO / FEB (national, all companies) Competencies: - Lobbying and advocacy - Networking and info dissemination among National Associations	National trade unions (intersectoral) ACV ABVV ACLVB Competencies: - Lobbying and advocacy - Networking and info dissemination among Sectoral Unions		VET and TVET Centers (W&F) Competencies: - Vocational, Education and Training - Continuous Professional Development - Networking with the local business environment	FSC Belgium, PEFC Belgium, WWF Belgium, ... Competencies: - Lobbying and advocacy - Sustainability and circular economy Parents and students (individual) - Choice of studies and schools

Low Influence/ Low Impact	**Public employment Services Arbeitsamt** (German speaking region) **Actiris** (Brussels Region) **Competencies:** - Regional policies **Belgian municipalities and provinces** **Competencies:** - Supporting local economy - Supporting and financing local (municipal and province) schools and students			**Houtinfobois** **Office Economique Wallone du Bois** (Walloon Region) **Competencies:** - Economical information - Product information on wood and specifically on local wood - Training for architects	**HE: Bachelor in Wood Technology (HoGent = HE)** **Competencies:** - Research and Innovation - Training - Cultural dissemination	**Workers W&F (individual)** - Choice of continuous development (CVET) - Choice of company to work for

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
High Influence/ High Impact	Public employment Services VDAB (Flanders) Forem (Walloon Region) Competencies: - Regional policies for the unemployed and for the labour market - Training of unemployed - Support for companies when engaging unemployed - Regional, specific premiums and subsidiary help Ministries and ministerial cabinets Ministry of Education Ministry of Work Competencies: - Policies and Politics	National sectoral Business Associations (W&F) Fedustria (wood and furniture industry) Houtunie (furniture smaller companies) Belgische Houtconfederatie (wood sector, logging, sawmills and wood and panel trade/import) Competencies: - Institutional Relationship - Lobbying and advocacy - Capacity building - Technical-regulatory lobbying - Promotion and support of the Belgian Wood and Furniture sector - Networking and info dissemination	National sectoral Trade Unions (W&F) ACV BIE AC ABVV ACLVB Competencies: - Lobbying and advocacy - Networking and info dissemination among members	Research centers W&F Wood.be (wood and furniture) WTCB / CSTC (construction, including wood) Competencies: - Research and Innovation - Laboratory Test - Product Certification - Technical-regulations	Educational networks KOV (catholic schools) OVSG (municipal schools) POV (provincial schools) GO! (public schools) 4 official networks of educational institutes Competencies: - Vocational, Education and Training - Definition and Update of the Curricula VLOR: Flemish Educational Council National sectoral Training Centre (W&F) WOODWIZE Competencies: - Implementation of (regional) policies on VET and CVET, non-discrimination and inclusion, Health and Safety in W&F - Definition and Update of the Curricula and sectoral qualification profiles - Networking with the local business environment (paritairy) - Continuous Professional Development -Vocational, Education and Training	Employers W&F (individual) - Branding - Engaging people + choice of CVET / professional development of workers - Choice of machines, products, markets... SERV (Flemish social economic advisory council) Competencies: - Lobbying and advocacy - Policies

High Influence/ Low Impact		European sectoral Business Associations (W&F) EFIC (furniture sector) EPF (wood panels) EOS (sawmills) CEI Bois (wood industry) etc... Competencies: - Lobbying and advocacy - Networking and info dissemination among National Associations - Technical-regulatory lobbying - Institutional Relationship with EU		European sectoral Unions Associations (W&F) EFBWW (European Federation of Building and Wood Workers) Competencies: - Lobbying and Advocacy - Institutional Relationship -Transversal Sectoral Projects		
Low Influence/ High Impact	Ministries and cabinets Ministry of Social affairs Ministry of social economy Ministry of Research and Innovation Ministry of Forestry (under Agriculture) Competencies: - Policies and Politics	National and regional business associations VOKA (Flanders, bigger companies) UNIZO (Flanders, small companies and independent workers) UWE (Walloon region, bigger companies) VBO / FEB (national, all companies) Competencies: - Lobbying and advocacy - Networking and info dissemination among National Associations	National trade unions (intersectoral) ACV ABVV ACLVB Competencies: - Lobbying and advocacy - Networking and info dissemination among Sectoral Unions		VET and TVET Centers (W&F) Competencies: - Vocational, Education and Training - Continuous Professional Development - Networking with the local business environment	FSC Belgium, PEFC Belgium, WWF Belgium, ... Competencies: - Lobbying and advocacy - Sustainability and circular economy Parents and students (individual) - Choice of studies and schools

Low Influence/ Low Impact	Public employment Services **Arbeitsamt** (German speaking region) **Actiris** (Brussels Region) **Competencies:** - Regional policies **Belgian municipalities and provinces Competencies:** - Supporting local economy - Supporting and financing local (municipal and province) schools and students			Houtinfobois Office Economique Wallone du Bois (Walloon Region) **Competencies:** - Economical information - Product information on wood and specifically on local wood - Training for architects	HE: Bachelor in Wood Technology (HoGent = HE) **Competencies:** - Research and Innovation - Training - Cultural dissemination	Workers W&F (individual) - Choice of continuous development (CVET) - Choice of company to work for

SWOT

	Strengths	Weaknesses
Internal	- Sectoral promotion to support domestic consumption of home furnishings (Ferm gerief) and the use of local wood (bois local) - Long tradition of woodworking and furniture in the sector. - The 'makers' sectors have good and promising image (also wood as natural resource) - Very big part of SME's (more than 50% have < 5 collaborators) = important flexibility and custom made work - Only a few big companies (> 250 collaborators), but top-notch in innovation and digitalisation - Largely implemented CNC-technologies - Relatively steady workforce (not much sector leavers) - Number of vacancies is increasing rapidly: +200% over 5 years, +15% 2019 vs 2018, in 2020: -25% received vacancies (Covid-19), since beginning of 2021 rapidly increasing (now on the same level as in 2019. - Large use of inclusion / disabled collaborators (average in Flanders = 0,7%, in wood and furniture sector = 2,74%)	- W & F Sector is declining in BE (-5,7% over 5 years), due to automation and digitalisation and non-replacement of people who are retiring + increasing competition of foreign countries (eastern EU) - Sectoral fragmentation. 3 different business associations for a relatively small sector in BE - Entrepreneurial fragmentation: high number of highly specialised micro and small enterprises . Difficult to reach with sectorial strategic actions + micro enterprises are often not so innovative. - Most businesses are family-owned, with little inclination to draw on external managerial expertise. - Sector is not very appealing to young people, neither for women. the ability to attract young people is difficult, especially when automation is high (production). - "Dual face" of wood as natural resource, on the one hand it is eco-friendly, on the other hand, no-one wants to contribute on deforestation.

	- Large participation for in-company trainings (on site) and use of incentives for that - More than average use of employment measures to engage new workforce - Number of recognised workplaces for dual learning is higher than the number of students - High number of schools that offer wood and furniture education (professional and technical level = EQF 3 + EQF 4) - High number of students in wood and furniture branch + high volume of internships	- High demand of trained workforce + big competition of other sectors for technical profiles (war for talent) - Less than average recruitment of specific target groups, such as refugees and non-EU foreigners - Fewer than average internships for job seekers (due to competition with construction sector) - Highly diversified level of technological and digital maturity and still underdeveloped use of customer-oriented technologies.

	Opportunities	Threats
External	- Widespread awareness on the themes of sustainability, circular economy, certifications (FSC, PEFC, green labels…), building with wood, local wood, … - Industry 4.0 makes 'made to order' and 'custom made' also available for SME's - Development of Twin Transition (Green and Digital): development of new sustainable, recycled, recyclable or functionalised materials, development of new digital technologies for production processes, data management, systems' integration → more demand for a specialized training / educational offer - New qualification levels (EQF 5) offer opportunities for stronger strategic thinking and increasing the digitalization within W & F sector - The demand for trained workforce is higher than average → long time work assurance/security (but there is also a lot of competition) - Digitalisation of training material and training offer increases on EU level - Valorisation and certification of Life Long Learning (on EU level) - Core profiles in W & F sector (see Bolster-Up2.eu) - A lot of immigrants and refugees, and also women could be led into the W & F sector (inclusion, CSR, anti-discrimination) - Relaunch of the sector post-Covid19 and the (increased) value of houses, interiors, furniture inside and outside the house…	- Progressive consumption of imported furniture (from the far east) - New distribution channels such as Alibaba, Amazon, … that offer import low quality furniture and wooden products, with no guarantees on quality and resource origin - Difficulties in finding + increasing costs for wood (resource materials) over the last 12 months (2nd half 2020 - 1st half 2021). - Competition with EU and non-EU countries with significantly lower labour costs, especially for mass products and/or products with lower added value - Aging labour force: more retirement foreseen then new (young) people who choose for the W & F sector (34% is over 50 years old and the need for replacement due to retirement is around 12%) - Around 20% of the vacancies are not filled in within a reasonable period (3 m) - Difficulties to reach out to the SME's with policies and strategic support - Many schools that offer wood and furniture education = in some schools not viable because of not enough students + lower investments (too much fragmentation) - Not much societal interest from parents, schools, students for Dual Learning (older, bad image)

Outline Analysis

This study has been performed by WOODWIZE and was validated by our Regional Stakeholders Group, in which are represented the 3 W&F business associations, Fedustria, Houtunie and the Belgian Wood Confederation, and the three official trade union in W&F, ACV BIE, AC ABVV and ACLVB. The representatives of the Flemish public employment services, VDAB, the representatives for W&F within the 4 Flemish educational networks, as well as representatives of the Flemish Ministry of Work and Social Economy and the Ministry of Education have also validated this analysis.

The wood and furniture sector in Flanders (BE) is very heterogenous and groups forest exploitation / logging (165 companies and 430 workers + 1.800 self-employed workers, of which 20% in Flanders), sawmills (131 companies and 1.200 workers, of which 50% in Flanders), trade and import of wood and wooden materials/panels (249 companies and 2.000 workers of which 55% in Flanders), furniture sector (including seats and sofas), wooden panels, wooden construction elements (doors, parquet, ...), wood packaging (crates and pallets), and other (semi-) finished wooden products (1.875 companies and around 14.000 workers and 4.000 employees, of which 80% in Flanders). The fragmentation of the sector, with the large predominance of small and medium-sized enterprises, is both its strength and its limit. The furniture industry's share of the wood and furniture sector's turnover is currently 40%, compared to 50% in 2010. This indicates that their competitive position is under strong pressure from international competition (e.g. producers from countries with lower labour costs and increase in cheap furniture imports from China and Eastern Europe).

In recent years, ecology and the environment have left their mark on the current management of the furniture companies. Corporate social responsibility, sustainability and circular economy are well known concepts in the furniture sector. Since January 2021, there is a take-back obligation for mattresses in Belgium.

The Flemish furniture industry is characterised by the strong combination of automation, digitalisation, and craftmanship. Automation is followed by 'interconnectivity' between man and machine, as well as between machines themselves. For many furniture companies, this is still a far cry, but interest is growing and the first experiments are taking place. Typical of the Flemish furniture sector is the 'craftsmanship' and the need to produce individualised products. The flexibility and skill of the craftsman is of an entirely different order than the highly automated production processes. Furniture companies seek the right balance between that craftsmanship and automation. But the path of digitisation has already been taken and will continue to be taken.
The wood industry concerns the production of wooden board material (30%), wooden construction elements (18%), wooden packaging (8%) and miscellaneous wood products (4%).

Wood packaging is more environmentally friendly than packaging made of other materials because it stores CO_2 in the wood and because production and processing require less energy. The wooden construction elements product group is strongly linked to the construction sector. It concerns the industrial production of doors, windows, parquet, rafters, wood preservation, timber frame construction and timber construction. Building with wood has been on the rise in recent years, and exports in this segment have decreased due to rising domestic demand. The share of wood construction in new construction has grown strongly and currently represents 11% of the total construction market. In addition to timber frame construction, new timber technologies are being developed that make wood the most climate- and environmentally-friendly building material.
The wood-based panels product group is the largest in the wood industry and includes companies that produce particle boards, MDF, OSB, plywood and veneer. By extension, there are producers specialised in panel processing, such as veneered or laminated boards, veneer parquet, laminate flooring, etc. Their share

in the sector has grown from 21.5% in 2010 to 30% in 2019. For these companies, it is very important that they can continue to operate in a market with European rules, because national or local rules can threaten the level playing field and create unfair competition.
This path requires the necessary human capital. Today, finding and retaining trained employees remains by far the biggest challenges for furniture companies.

The wood industry is a high-tech sector and in order to be and remain successful, investments in both machinery and human capital are very important. The war for talent within the tightening labour market and the mismatch between labour/workforce supply and demand means that there are a large number of 'bottleneck vacancies'. Therefore, many sectoral initiatives target young people or vulnerable groups in the labour market to provide them with the right attitude and/or basic skills to work in the wood industry. 'Proportional employment' and 'diversity' / social inclusion are the key words in this domain.

Italy

Mapping

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
High Influence/ High Impact	**Ministry of Economic Development Competencies:** - Industry and trade development - Industrial Politics: Competitiveness Innovation and industrial research, technology transfer, patents and trademarks, funds and concessions, SMEs support, competition promotion **Ministry of Ecological Transition Competencies**: - Sustainable development - Protection / enhancement of the environment, the territory, and the ecosystem, including water and air quality, protected areas - Promotion of the Circular economy - Policies to mitigate climate change **Ministry of Agricultural, Food and Forestry Policies Competencies** -Government policy on	**Confindustria National Association representing manufacturing and service companies:** -Institutional Relationship Lobbying and advocacy -Capacity building -Technical-regulatory lobbying -Promotion and support of the Italian sector		**Ministry of University and Research** -High Education -Curricula definition -Definition of the National Research Plan (Piano Nazionale della Ricerca)	**Ministry of Education** -General Management of the Italian Education and Training System -Vocational education and training -Primary, Secondary, Superior and Professional qualification -Curricula definition	

	agriculture, forests, food and fisheries at national, European and international level					
High Influence/ Low Impact	Italian Regional Councils -Support to the local Economy -Vocational and Professional Training -Woodland and forest heritage -Healthcare	Sectoral European Associations (EFIC, FEP, FEMB, EPF, etc...) Competencies: -Lobbying and advocacy -Networking and info dissemination among National Associations	CGIL – CISL – UIL (Unitary Unions – Competencies: - Counterparts of FederlegnoArredo for the National Collective Labour Agreement for the Furniture sector - Protection of workers -Lobbying and advocacy		HE and University Design and Wood Technology Departments Competencies: -Research and Innovation -Training - Cultural dissemination	
Low Influence/ High Impact	ITA – Italian Trade Agency (Governmental Agency) Competencies: -Support of the business development of our companies abroad -Promotion of the attraction of foreign investment in Italy.	Regional Wood and Furniture Clusters *(Cluster Legno Arredo Casa Friuli Venezia Giulia; Distretto Interni e Design – DID Tuscany; Cluster Marche; Cluster Legno Piemonte)* Competencies: - Promotion and support of the local Wood and Furniture sector -Training and Innovation activities Italian Fair System (Salone del Mobile, MADE expo, CERSAIE, MARMOMACC, etc) Competencies: -Business Matching manufacturers/buyers –Operators Consor		Research and Certification Centers COSMOB (Pesaro Marche) CATAS (UdineFriuli Venezia Giulia; Lissone Lombardy; Pesaro Marche) Competencies: -Laboratory Test -Product Certification -Training and Innovation research -FAB Lab University and private R&D departments Competencies: -Laboratory Test -Product Certification -Training and Innovation research -FAB Lab	VET and TVET Centres in the Wood and Furniture field Competencies: -Vocational, Education and Training -Continuous Professional Development -Definition and Update of the Curriculum Profiles -Networking with the local business environment	

		Italian National Trading Furniture Association (Federmobili) Competencies: - Lobbying and Advocacy -Institutional Relationship -Promotion and support of the Italian furniture Trading operators Sectoral National Clusters for recycling and certification (Rilegno, Conlegno) Competencies: - Lobbying and Advocacy - Institutional Relationship - Certification / Training Sectoral Professionals (Architects, Designers, Creative community, press/media operators) Competencies: -Project development -Innovation and sustainability boost				
Low Influence/ Low Impact	Italian Municipalities Competencies: -Supporting local economy -Supporting local schools and students		European Sectoral Unions Associations Competencies: - Lobbying and Advocacy - Institutional Relationship -Transversal Sectoral Projects		Italian ITS (Higher Technical Education) Association Competencies: -Networking and Lobbying activities among the ITS training centres and towards the national and Regional Institutions	Environmental Associations (Legambiente / WWF) Competencies: -Lobbying and advocacy - Communities and citizens engagement -Cultural dissemination about sustainability and circular economy

SWOT

	Strengths	Weaknesses
Internal	- Identity and tradition: high level of specialised expertise and in-house know-how - Breakdown of the wood-furniture sector in districts characterised by homogeneity of production types and a high intensity of relations between companies, research centres, the education/training system and stakeholders. - Breakdown of the sector into SMEs, capable of expressing production flexibility, rapidity in adapting to market changes and production quality. - Developed tendency towards innovation (the furniture-lighting sector in Italy is second in Europe for patent registration). - Presence of capital companies that are world leaders in the sector in terms of innovation, design, ability to interpret trends and market needs. - An entirely Made in Italy supply chain: from components to the finished product, Italian furniture is a supply chain whose production is still entirely domestic. - A supply chain capable of attracting international creativity: the high-end positioning of Italian furniture companies helps to attract designers and creative talents from all over the world. - A complete and integrated supply chain: Italian wood-furnishing products are part of a system that knows how to enhance and promote them (logistics, transport, creativity and communication, events throughout the market). - The Salone del Mobile in Milan, the most important trade fair in the world for the furniture industry. - Widespread awareness on the themes of sustainability, circular economy, certifications - A single national representative federation, divided into 11 sectoral associations, with consolidated capacity for institutional dialogue. - Measures to support domestic consumption of home furnishings (Furniture Bonus up to €16,000 in case of home renovation). -	- Entrepreneurial fragmentation: the high number of highly specialised micro and small enterprises weakens the ability to create a system and implement strategic actions (few joint stock companies). - Most businesses are family-owned, with little inclination to draw on external managerial expertise. - A production sector that is not very appealing to young people and women: the ability to attract young people is weaker than in the fashion, food, automotive, and creative industry. - Highly diversified level of technological and digital maturity and still underdeveloped use of customer-facing technologies and market approach. - Fragmented, traditional, non-innovative sector distribution - The relationship with the academic world and research community is irregular and far from open innovation models. - Limited number of new enterprises / start-ups / innovative start-ups. - Rather advanced entrepreneurial age, often with difficulties in generational changeover. - Weak focus on inclusion of disabled/ frail persons. - Sourcing of the timber needed for the supply chain comes almost entirely from abroad. Insufficient valorisation of the Italian wood and forest heritage.

	Opportunities	Threats
External	- Sector with high sensitivity to and innovation of business models based on sustainability and circular economy. - Increasing export shares and positioning on the global market, thanks to the development of emerging markets attracted by Made in Italy products. - Evolving technological and digital landscape of companies thanks to measures - including financial measures - of Industry 4.0. - Development of regional clusters (Friuli Venezia Giulia, Tuscany, Marche) facilitating relations between the business world and the academic and research system, with important consequences in terms of Policy. - Development of 'green' and sustainable certifications. (e.g. Made Green Italy). - Progressive development of training for the sector articulated at national level for all EQF levels (vocational training institutes, technical institutes, higher technical institutes, bachelor's and master's degrees, first and second level master's). - Development of Twin Transition (Green and Digital): development of new sustainable, recycled, recyclable or functionalised materials, development of new digital technologies for production processes, data management, systems' integration. - Progressive evolution of professionals in the sector, increasingly attentive and trained in the management of business innovation. - Relaunching the value of the asset that is a house, also following the Covid-19 pandemic, with a revival of consumption hierarchies. - Infrastructures and transport facilitating trade relations with the Alpine area, the Mediterranean basin and the Balkan countries.	- Progressive drop in domestic consumption of Made in Italy furniture. - Sharp rise in raw material costs over the last 12 months (2nd half 2020 - 1st half 2021). - Difficulties in finding raw materials or semi-finished products (lack of availability on the market). - Crisis in Italy's ability to compete with EU and non-EU countries with significantly lower labour costs. - Fragility of the interior finishing sector (doors, windows, doors and windows, wooden floors) and of the supply chains with lower added value. Lack of investment in innovation and design threatens to drastically reduce its global positioning. - Difficult access to credit due to micro-sized companies. - Counterfeiting: "Italian sounding" products in the furniture sector too and the growing phenomenon of counterfeiting in the furniture/lighting/furnishing accessories undermine the value of the branded product. - Changing lifestyles in the new generations, with a weakening of the value of the asset that are a house and furniture.

Outline Analysis

The Italian wood-furnishing sector currently includes **73,000** companies, **311,000** workers and a total turnover of **42.5 billion euros**. It **employs 8.5% of the workers of the entire Italian manufacturing sector** and with **15.2% of the companies**, the wood-furnishing sector is the second largest in Italy in terms of number of companies.

It is characterised by **an entirely Made in Italy supply chain**: the semi-finished and finished product industries are often just a few kilometres apart, thus fostering deep relationships, exchanges and mutual knowledge of the market. The **regional clusters** (public-private entities that bring together companies, associations, the chamber system and institutional players in the area) reflect the liveliness of this regional dimension, also in the dialogue with local institutions.

The fragmentation of the sector, with a clear predominance of small and medium-sized enterprises, is both its strength and its limit. Its ability to adapt quickly to change, its know-how in combining innovation and tradition, and the fact that it is divided into specialised districts clash with the limitations of a size that is too small to encourage major investment, difficulties linked to the changeover from one generation to the next, a progressively ageing workforce and a still wide gap between the world of academic and private research.

The sector seems to reflect the ambiguity of the Italian word 'artisanal': on the one hand it expresses all the richness of a know-how of an ancient tradition, capable of customising the product and fully understanding the unique needs of the customer, on the other hand it includes the limit of something that is not on a large scale, that lacks contemporaneity.

Italian companies in the sector were among the first to develop good practices and business models inspired by the principles of the circular economy and to place the issue of sustainability (in its environmental, social and economic ramifications) at the heart of their development.

The scenario of technological evolution and digital transformation is different: although there are good examples of the application of the measures that the government's Industria 4.0 support package has generated, there is still a long way to go. In the same way, the revival of domestic consumption - also supported by the "Furniture Bonus" promoted by the Italian government a few years ago for families renovating their homes and renewing their furnishings - has not made up for the serious hemorrhage of recent years, which has been partly offset by decisive development on foreign markets, both close to home (France, Germany, UK) and far away, such as the USA and China.

The training system also suffers from a gap between cutting-edge academic training and vocational training that needs a stronger network with businesses and laboratories that are not always equipped with effective tools or training courses. The new ITS system represents a valuable opportunity to bring young people into the sector, with a dual training pathway, between frontal classes and long periods of training in the field. ALLVIEW is an excellent opportunity to test this mode on a large scale, bringing together cutting-edge training content (Circular Economy, Internet of Things, AAL).

The national federation, the sector's representative associations and the institutional actors have the task of supporting the sector's growth, also through a virtuous dialogue with local, national and European institutional actors.

Slovenia

Mapping

Legend:

- MEDT (Ministry for economic development and technology of Republic of Slovenia)
- CCIS WPFA (Chamber of Commerce and Industry of Slovenia, Wood processing and furniture association)
- WIC (Wood Industry Cluster Slovenia)
- UL BF (University of Ljubljana, Biotechnical Faculty, Department of Wood Science and Technology)
- NIVET (Institute of the RS for Vocational Education and Training)
- Innorenew COE (Renewable Materials and Healthy Environments Research and Innovation Centre of Excellence)
- Companies (Alples d.d., LIP Bled d.o.o., Marles Houses d.o.o., M Sora d.d.)

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
High Influence/ High Impact	MEDT **Competences:** - Proposals for measures to increase the competitiveness and development of the wood industry - Elimination of administrative barriers to the development of the wood industry and greater use of wood - Financial support for development and investment - Promotion of the use of domestic wood - Support for the internationalization of the wood industry - Support for the promotion of wood professions Analysis and strategies **Responsibilities:** - Increasing the competitiveness of the wood industry - Providing an appropriate and stable business environment - Establishing and strengthening forestry–wood chains	CCIS WPFA **Competence:** - Lobbying -Sectorial capacity building -Promotion and support to the wood-furniture sector development - Media relations - Trade union negotiation - Strategic initiatives - Wood sector statistics **Responsibilities:** - Building favourite conditions for the sector development - Building the sector recognition - Removing barriers to sector development		UL BF **Competences:** -Research and innovation -New wood materials and technologies -Testing **Responsibilities:** -Widening and deepening knowledge of wood -Research on new materials / technologies -Application knowledge	NIVET **Competences:** Development of the qualifications system - Assure quality and efficiency of VET - Support to education and training providers - Developing an apprenticeship system - Developing vocational qualifications in Slovenia **Responsibilities:** - Development of VET - Raising quality and attractiveness of VET - Cooperation with the economy, Chambers and other social partners **UL BF** **Competences:** - Education - Training Responsibilities: - Teritary education for wood sector and Science	

	- Increasing the consumption and processing of wood into products with the high added value - Promoting the use of wood and wood products					
High Influence/ Low Impact						
Low Influence/ High Impact		WIC Competences: - R&D projects - Training and innovation activities Internationalization - Promotion of wood use - Operational support to the CCIS WPFA **Responsibilities:** - Support to cluster members at raising their competitiveness		Innorenew COE Competences: - Research on renewable materials and sustainable buildings - Transferring scientific knowledge into industrial practice **Responsibilities:** - Advance the state of the art and achieve scientific and innovation excellence through interdisciplinary science, especially in research areas: wood modification and restorative environmental and ergonomic design		Companies Competences: - Manufacturing and services - HR development **Responsibilities:** - Profitable economic activities in the field of wood and furniture sector and value chains - Corporate social responsibility - Responsibility for preserving the environment
Low Influence/ Low Impact						

SWOT

	Strengths	Weaknesses
	Education in Forest&wood sector	
Internal	• good cooperation of educational institutions with industry • excellent professors / teachers • well-organized distance learning • successfully digitalized study process • established models of dual education at all levels of education • teaching in modern applications (CAD / CAM, Solidworks, ...) • students have access to modern equipment • various competence centres for human resources development have been established • CE and digitalisation topics are well included in existing study programs • Social partnership is well presented and included at VET level	• there is enough knowledge available to innovate, but we do not know how to use it • outdated / rigid education system • employees are mostly older - the problem of aging of workforce • low interest in education among older employees • cooperation between VET and HE institutions regarding study program is minimal • VET and HE study programs rarely include AR and VR technologies as educational tools • VET system is slowly responsive to labour market needs
	Industry, Research and training	
	• great connection within the forest timber chain • most companies are affiliated with R&D institutions • due to their small size, companies know each other (it is known exactly who does what) • a lot of accumulated knowledge and state-of-the-art technologies/equipment in R&D institutions • opportunities for the development of business model • identified companies' need for development • great flexibility and quality of companies • state-of-the-art technologies/equipment in companies	• too low level of highly educated in companies (the majority of them remain in universities) • dispersion, so the situation of the industry is improving too slowly • companies operate in a hostile business environment • protection of individual interests (narrow view of companies regarding the sharing of knowledge and information) • Insufficient product, services and brand development • there is no interest in additional training in companies among VET teachers
	Social Inclusion	
	• a strong sense of solidarity and fellow human beings prevails among Slovenes • various private institutions, employment centres, companies for the disabled and well-developed cooperatives have been established • The country offers a wide range of incentives and measures for the employment of target groups, the disabled and the hard-to-employ unemployed. • The legislation enables the acquisition of concessions for the development of social services and support for social entrepreneurship	• insufficiently developed mechanisms for statistical and analytical monitoring of social entrepreneurship. • The problem is complicated, dispersed and poorly coordinated legislation, which affects the dispersion and incoherence of resources for the implementation of the set measures in the strategies. • not too stimulating tax relief and unequal treatment of certain legal forms of social entrepreneurship • insufficiently trained managers in social enterprises. • Lack of solutions regarding education of children from social weak environment

	• established SPOT entry points, where social entrepreneurs receive all the necessary information in one place. • good legislation solution regarding education of children with special needs	Cooperation between schools in this field is weak
	Opportunities	Threats
External	Education in Forest&wood sector	
	• strengthen the cooperation between education and business • strengthen the cooperation of VET schools and HE in the F&W field • developing an efficient system for lifelong teacher training regarding new topics and technologies used by teaching	• rigid / nonflexible legislation system for changing the study programs • aging of teachers and education system • insufficient teacher training innovations and VET programmes updates are implemented too slowly • VET educational system is not flexible enough
	Industry, Research and training	
	• search for synergies - more cooperation between R&D (division of laboratories and equipment) • opportunities also appear in cross-sectorial value chains • the accumulated knowledge should be linked to other industries - greater visibility is needed between industries • seeking synergies abroad • systematic support from policy makers, decision makers • good legislation bases for cooperating VET schools and social partners	• Lack of educated workforce • the gap between expectations and the supply of knowledge institutions • self-sufficiency • researchers work among the expectations of industry (companies) and at the same time fear for EU funding • the results / needs of EU projects are often irrelevant to our economy • due to poor R&D funding and a supportive environment, companies keep track of money by acquiring projects that are available • focus on developing basic skills what leads to non-competitiveness • companies do not take enough opportunities to influence VET educational programmes
	Social Inclusion	
	• social entrepreneurship will become a major generator of regional and local development in the coming years • increased visibility of social entrepreneurship in the public. • the opportunity also represents the rapid aging of the population and the needs of older people for care, health care and integration into society, so social entrepreneurship has great potential. • new opportunities are also in connecting social enterprises with classic socially responsible enterprises	• insufficiently recognized potential of social entrepreneurship at the level of ministries, which, in accordance with the Social Entrepreneurship Act, enable the implementation of development policy, each in its own way in an uncoordinated manner. • Insufficient investments in teacher training in the field of social inclusion • Lack of long-term national solutions especially in the field of financing

Outline Analysis

This analysis has been performed with the participation of stakeholders that represent the fields of: HE, VET, R&D as well as, Business and Training authorities.

Slovenia is one of the most heavily forested countries in Europe. Forests cover more than 58% of the country's area. The wood and the forest, as the largest natural renewable resource, are of great strategic importance for Slovenia. Wood processing and the furniture sector (NACE Code C16 and C31) is one of the traditional production- and export-oriented activities of Slovenian Industry. Currently, the Slovenian wood-furniture sector includes 2,477 companies, 12,840 workers and a total turnover of 1.5 billion euros. Employees in the wood-furniture sector represent 7% of employees in the manufacturing sector of Slovenia.

In 2010, the wood industry was selected for the first time between 8 priorities and promising industries and wood became a strategic material of national importance.

In 2015, the Wood Industry Directorate at the Ministry of Economic Development and Technology of Republic of Slovenia was established. The Directorate is a public policy level body focused on development of the Slovenian wood sector. The Wood processing and Furniture Industry Association at the Chamber of Commerce and Industry of Slovenia is the largest voluntary association of Slovenian woodworking and furniture companies. The Association is an effective economic lobby and represents the interests of businesses in relation to the government, media and trade unions. The Association works closely with the Wood Industry Cluster, which provides operational support to the association in the field of R&D projects, internationalization, training and promotion of wood use. The Association is an active stakeholder in the implementation of the Smart Specialization Strategy of Slovenia, through the cross-sectorial Strategic Development and Innovation Partnership - Smart Buildings and Home with Wood Chain (SRIP Smart Buildings). In addition, there are R&D and educational institutions in the sector, the most important of which are University of Ljubljana, Biotechnical Faculty - Department of Wood Science and Technology, Innorenew COE and Faculty of Design.

Today, wood processing companies achieve competitiveness with custom products and products tailored to customer needs, great flexibility, high reliability and quality and a strong export orientation. Recently, the industry has been gaining in importance mainly due to the contribution of the use of wood in the fight against climate change and the associated growing demand for wood products.

Strategic planning and tailored company management based on an understanding of rapidly changing market needs and the requirements of the wider social environment (digitalization, circular economy, design management, new materials and technologies, innovation, ..) are becoming increasingly important. The cross-sectorial connection with designers and other creative groups is also important for the transition of the wood processing industry to a higher level of added value. Businesses need to be encouraged and trained to transform and modernize their businesses so that they can constantly adapt to ever-faster changes.

In 2016-2018, there was a noticeable increase in investment and extensive staff training (VET) with the project of the Competence Center for Human Resources Development in the Wood Industry (KOCles 2). Currently, the Wood Industry Cluster is preparing the 3rd edition of the KOCles. The KOCles will be inter-linked also with SRIP Smart Buildings, Digital innovation hub Slovenia, wood education and research institutions, public vocational training institutions and industry associations.

The main strengths in wood sector are good cooperation of educational institutions with industry, great connection within the forest timber chain, companies know each other well and there is present a strong sense of solidarity among Slovenes.

The main weakness at educational level is the fact that there is enough knowledge available to innovate, but it cannot be used (companies simply do not know how to use it). On the other hand, companies are facing a shortage of technical staff and an aging employee structure.

Among the opportunities we perceived that there is space for strengthen the cooperation between education and the economy, between vocational and higher education schools in the field of wood and furniture and it is also necessary to develop an effective system for training teachers on new technologies. New synergies need to be found - more R&D cooperation (sharing laboratories in equipment), opportunities also arise in centralization, and a good legislative basis for involving VET in education and the social partners.

Slovenia is facing an insufficiently recognizable potential for social entrepreneurship at the level of ministries, which, in accordance with the Social Enterprise Act, enables the implementation of development policies, each in its own failed way.

Among the different threats that is facing Slovenia related to the education is that Slovenia has a rigid / inflexible legislative system for changing study programs, meeting with the aging of teachers in the education system. There are gaps between the expectations and supply of knowledge institutions, researchers work in line with the expectations of industry (companies) and at the same time fear EU funding.

Netherlands

Mapping

Note: Depending on the particular needs and circumstances of your region, the structure and composition of your regional stakeholder groups may vary. However, they should be linked to the multilevel governance of the EU Funds. For the collection of Best Practices (next step – D6.2), it is also mandatory that at least a policy maker or VET authority, a representative of education (preferably TVET) and a sectoral representative, such as an industrial association or a union, are included. Preferably, they will also involve institutions of higher education, as well as technological innovation centres and applied research organisations.

We have interpreted the terms influence and impact as follows:

High Influence/ Low influence

Influence is determined by the degree of influence on the material/knowledge to be transferred. E.g.: HMC and ECM produce teaching materials and thus have a greater influence on the interior design industry than the rest of the schools. Fiction Factory are very busy with sustainable innovations but only have their own customers and environment that they influence.

High Impact/ Low Impact

The larger the target group (numbers) that is reached, the higher the impact, a branch organization or school reaches a much larger group than a company.

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
	Include name of institution as well as competencies and responsibilities.					
High Influence/ High Impact	SBB MBO raad Ministry of Education, Culture & Science	CBM	FNV Bouw CNV Vakmensen	Blue City (circular economy)	Expertise Centrum Meubel (ECM) HMC (VET)	UWV
High Influence/ Low Impact		Feadship Fiction Factory Castelijn Meubelindustrie Coors De Vries trappen Intos interior solutions Piet Hein Eek Vepa Joris Laarman Hoogendoorn M.B.I. Vroonland Kloosterboer decor b.v. The new Makers Tchai international b.v.		Centrum hout Makerspace Rotterdam De Waag Amsterdam Broeinest		

Low Influence/ High Impact		Blok plaatmateriaal Baars en Bloemhoff De Groot Machines (MR) Feadship Pfleiderer WSB interieurbouw Woodwave Verweij houttechniek			Summa College (VET Eindhoven) ROC Twente (VET) Deltion (VET Zwolle) Friesland college (VET) Hogeschool van Amsterdam faculties AI & robotics (HE) Hogeschool van Rotterdam – innovation dock RDM (HE) Alfa College (VET)	
Low Influence/ Low Impact		de Vries Houtbewerking Fijn timmerwerk Finemarq Hemlock Houtwerk Van Assem **Roord Binnenbouw**				

Note: Selected companies are more or less involved in Allview project and not complete. Companies will be added throughout the duration of the project.

SWOT

	Strengths	Weaknesses
Internal	<u>Business</u> Selected companies embrace innovations, new techniques, CE Work opportunities for job seekers more than sufficient Branch organisation CBM is active member of many cooperation platforms (including EFIC) <u>Education & training, research</u> Since 1929 HMC has created a close relationship between company representatives, students and teachers High number of internships during students' educations create solid ground for latest technologies used at companies Available F&W training courses are increasingly focusing on new techniques, trends, and digitalisation, and incorporated in qualification dossiers CE, digitalisation, LLL are all part of HMC quality plan and teacher training in these fields is a key element Project groups on sustainability, new techniques started 2 years ago and have resulted in: New teaching subject: sustainability All work planning teachers are taught in several state of art CAD applications. Demonstrations and training on offer with Shaper CNC. Students are incorporating AR and VR technologies in their master pieces and have access to very modern equipment. <u>Public Authorities</u> Many possibilities to get subsidies for cooperation between education and labour market. Financing local projects stimulates and subsidizes innovations and development (e.g. RIF for Top Centrum meubel, annual regional subsidies for 'education and labour market') Large quantity of relevant big data available	<u>Business</u> Finding well trained staff - growing gap Work planners in highest demand on labour market Recent labour market shortage percentage/ numbers not easily obtained (data not available) Labour shortages are quantitative and qualitative <u>Education & training, research</u> Our core product in VET is "teaching students", therefore taking time out for teacher training is often compromised. Cooperation with HE institutes is minimal. <u>Public Authorities</u> A critical weakness in the project is the gap between the work field and management / project structure. European collaborations and overarching projects and analyses only reach the workplace at a later stage, partly due to language and project jargon that are difficult to interpret on the work floor and often not immediately usable Rules and regulations can be too stringent, inflexible

	Opportunities	Threats
External	<u>Business</u> Extending existing networks between schools and companies, creating platforms (Allview themes) to listen and learn from each other's future needs and wishes Enhance cooperation at all levels; in addition to dual learning possibilities, company visits in the school (guest lessons online or on location, masterclasses, etc), as well as increasing (international) teacher internships at companies > professionalisation in education Cross-sectoral cooperation within the chain, e.g. the chemical industry <u>Education & training, research</u> Make alumni ambassadors for new techniques and pioneers for education and business Increase cooperation with other VET schools and HE in the F&W field Act on the realisation of need to close the knowledge gap, by allowing time out for sufficient teacher training. <u>Public Authorities</u> Finding a more pro-active cooperation in anticipating relevant big data.	<u>Business</u> Most companies focus on regional and national labour market, low readiness for European joint ventures. Collaboration with schools is compromised due to the large quantity of work and the face of major staff shortages. <u>Education & training, research</u> Time availability <u>Public Authorities</u> Difficulty in anticipating on new strategies due to lack of recent big data.

Outline Analysis

The ambition to advance the furniture industry both qualitatively and quantitatively is widely supported by VET schools, business and public authorities.
Five years ago, a large, subsidized cooperation project started (Topcentrum Meubel) to find answers to various developments:

- the number of employees in the sector decreased, further exacerbated by the retirement wave.
- technological developments and the emergence of new materials in the industry

The goals were to

- contribute to the sustainable innovative strength and the international competitive position of the affiliated companies.
- develop a sustainable and vital training infrastructure, with innovative furniture and
- interior design courses that provide state-of-the-art education by increasing range of available courses

This way a better connection was created from education to industry.

Educating 450 VET students (via school based and work-based education streams) per year, which leads to an influx of at least 400 'fresh' employees for the furniture industry with the most up-to-date knowledge and expertise.

1. Development of 14 electives focused on new production techniques.
2. Teacher training/internships within affiliated companies
3. At the three pioneering schools (Summa College Eindhoven, ROC Twente and HMC), state-of-the-art practice centres have been equipped. The arrangement and choice for new machines were tested in advance against the vision and insights of the business partners.
4. In addition to recruiting students at lower secondary vocational education, there has been new focus on promotional activities for recruitment of students from higher general secondary education by offering shorter term vocational educational paths (with sufficient results)
5. The furniture industry needs training companies for students (in school based as well as worked based education). This requires regional partnerships to which new companies want to commit. Close links are needed between companies and the training providers of their future employees.

A growing area in education and shortage on the labour market are work planner in the W&F sector. Student numbers have doubled over the last few years, but more are needed to close the gap.
Educational materials have been developed for this work field (e.g. *www.dewerkvoorbereider.nl*)
The W&F branch organisation, the national W&F expert centre, affiliated companies and 6 VET schools worked together on these results. As these results are all in line with ALLVIEW goals, we aim to continue working with these key stakeholders in the Allview platform.

France

Mapping

Note: Depending of the particular needs and circumstances of your region, the structure and composition of your regional stakeholder groups may vary. However, they should be linked to the multilevel governance of the EU Funds. For the collection of Best Practices (next step – D6.2), it is also mandatory that at least a policy maker or VET authority, a representative of education (preferably TVET) and a sectoral representative, such as an industrial association or a union, are included. Preferably, they will also involve institutions of higher education, as well as technological innovation centres and applied research organisations.

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
	Include name of institution as well as competencies and responsibilities.					
High Influence/	Public employment Services	National sectoral Business Associations (W&F)	National sectoral Trade Unions (W&F)	Research centers W&F	Educational networks	Employers W&F
High Impact		Local business associations	Ameublement français	/	/	/
		Competencies:	Competencies:			
	Ministries	- Report needs of companies to Trade Unions	- Lobbying and advocacy			
	Ministry of Industry (Engineering schools)	Local business associations (ex MAGE)	- Networking and info dissemination among members			
	Ministry of Culture (Schools of Architecture and Design)		- definition and development certificate of professional qualification			
	Ministry of Agriculture (Agro Paris Tech and CFPPA)	Competencies:				

	Ministry of National Education, Research and Innovation (regional colleges and high schools, GRETAs, regional technical colleges and high schools, universities, grandes ecoles under this Ministry) **Competencies:** - Define the missions of the training centres - finance initial or vocational training centres (e.g. GRETA)	- run training courses to meet the specific needs of companies				
High Influence/ Low Impact				FCBA Competencies: - Validation of innovation through testing and standardisation	National sectoral Training Centre (W&F) AFPIA (Lyon, Est-Nord, Ouest) GRETAs	

				- Evolution of standards and technical solutions - Advanced professional training European sectoral Unions Associations (W&F) EFBWW (European Federation of Building and Wood Workers) Competencies: - Lobbying and Advocacy - Institutional Relationship -Transversal Sectoral Projects	FIBOIS Aura Competencies: - Implementation of (regional) policies on VET and CVET for the wood and furniture sector - Definition and Update of the Curricula and sectoral qualification profiles - Networking with the local business environment - Continuous Professional Development -Vocational, Education and Training	
Low Influence/ High Impact	Ministries and cabinets / Competence operators OPCO (OPCO2i, AKTO) Competencies:	National and regional business associations Chambers of Commerce and Industry Competencies: -Inter-company events	National trade unions (intersectoral)		VET and TVET Centers (W&F) Grandes Ecoles ENSTIB/ESB Ecole Boulle Competencies: -Design schools -Engineering schools	FSC France, PEFC France, WWF France, ... Competencies : - Lobbying and advocacy

	- Responsible for supporting vocational training - Ensuring the financing of apprenticeship and vocational training contracts	-Organisation of trade fairs -International business relations **Chambers of Trade and Crafts** **Competencies:** -Local lobbying -Organisation of professional meetings -Promotion of the craft industry **Interprofessions (ex. Fibois AURA)** **Competencies:** -Report to the Grandes-Régions the needs of companies (in terms of training or financing of development projects) -Act as a conduit between the Grandes-Régions and local businesses -Local lobbying **European sectoral Business Associations (W&F)** **EFIC (furniture sector)** **EPF (wood panels)** **EOS (sawmills)** **CEI Bois (wood industry)** **etc...** **Competencies:** - Lobbying and advocacy			-High level training -Entry of skills in companies	- Sustainability and circular economy

		- Networking and info dissemination among National Associations - Technical-regulatory lobbying - Institutional Relationship with EU				
Low Influence/ Low Impact	Public employment Services Pôle Emploi Competencies: -Apply policies for the provision of training leading to qualifications to people undergoing retraining				HE: Bachelor in Wood Technology (HoGent = HE)	Workers W&F (individual)

SWOT

	Strengths	Weaknesses
Internal	▪ Sectoral promotion to support domestic consumption of furniture (Ameublement français trade union). ▪ Long tradition of woodworking and furniture in the sector. ▪ A very large proportion of SMEs (more than 83% have < 9 employees) = high flexibility and customised work. ▪ Only a few large companies (> 250 employees), but leading in innovation and digitalisation. ▪ 73% of exports to Europe, France is the 5th largest European furniture producer ▪ 8 Certificates of Professional Qualification (CQP) have been created since January 2019, bringing the total offer of these certifications to 16 CQPs. ▪ High number of schools offering training in the field of wood and furniture	▪ Although employing a relatively high proportion of under-30s (19%), companies are facing recruitment difficulties, particularly in support functions such as marketing and sales. ▪ The sector is not very attractive for young people, nor for women who represent 28% of employees. It is difficult to attract young people, especially when there is a high level of automation (production). ▪ Difficulty for SMEs to integrate new skills due to their size. ▪ "Double face" of wood as a natural resource: On one hand, it is environmentally friendly, on the other hand nobody wants to contribute to deforestation. ▪ High demand for skilled labour + strong competition from other sectors for technical profiles (war for talent). ▪ Very diverse level of technological and digital maturity and still underdeveloped use of customer-oriented technologies.
	Opportunities	**Threats**
External	▪ Broad awareness of sustainability, circular economy, certifications (FSC, PEFC, green labels...), wood construction, local wood, etc. ▪ Industry 4.0 makes "made to order" and "tailor made" also accessible to SMEs. ▪ The sector is growing in exports, driven by the image of the "French art of living à la française" and "made in France". ▪ Development of a double transition (green and digital): development of new sustainable, recycled, recyclable or functionalised materials, development of new digital technologies for production processes, data management, integration of systems with more demand for specialised training/educational offer. ▪ Digitalisation of training material and training offer is increasing at the European level. ▪ Valorisation and certification of lifelong learning (at European level). ▪ The number of companies has decreased from 2015 to 2018 (-7%) due to further concentration of companies. ▪ Post-Covid19 revival of the sector: the French are spending heavily on improving the comfort of their homes	▪ Furniture imports have been increasing for several years. ▪ Growing e-commerce distribution channels offering low-quality furniture and wood products from import, with no guarantee of the quality and origin of the resources. ▪ The development of e-commerce is disrupting small, non-digitalised companies and increasing pressure on prices ▪ Difficulties in finding wood and increase in wood costs since 2020 ▪ Competition with EU and non-EU countries with significantly lower labour costs, especially for mass products and/or products with lower added value. ▪ Ageing of the workforce: retirements of 10% to 20% of the workforce are expected in the next 5 to 10 years. ▪ The number of employees decreased slightly from 2016 to 2019 (-6%) due to the concentration of companies on the one hand and the modernisation of production machinery on the other. ▪ New working habits change the short-term needs in the office furniture sector

Outline Analysis

The forestry-wood sector includes activities related to forestry exploitation as well as industry (woodworking, furniture manufacturing, paper industry, packaging industry) or construction (joinery companies, carpentry, parquet and paneling manufacturing, etc.) or arts and crafts.
The sector represents in 2019 378 000 direct jobs, including 35 400 jobs in forest management, logging and sawmills; 119 500 in woodworking (furniture, paper and cardboard, packaging); 131 400 in wood construction, 40,000 in wood energy, 35 000 in the furniture sector.
The commercial balance between exportations and importations is negative, which means that France has to import wood to meet the industrial needs. 83% of the added value is distributed between 5 final products markets.*10*

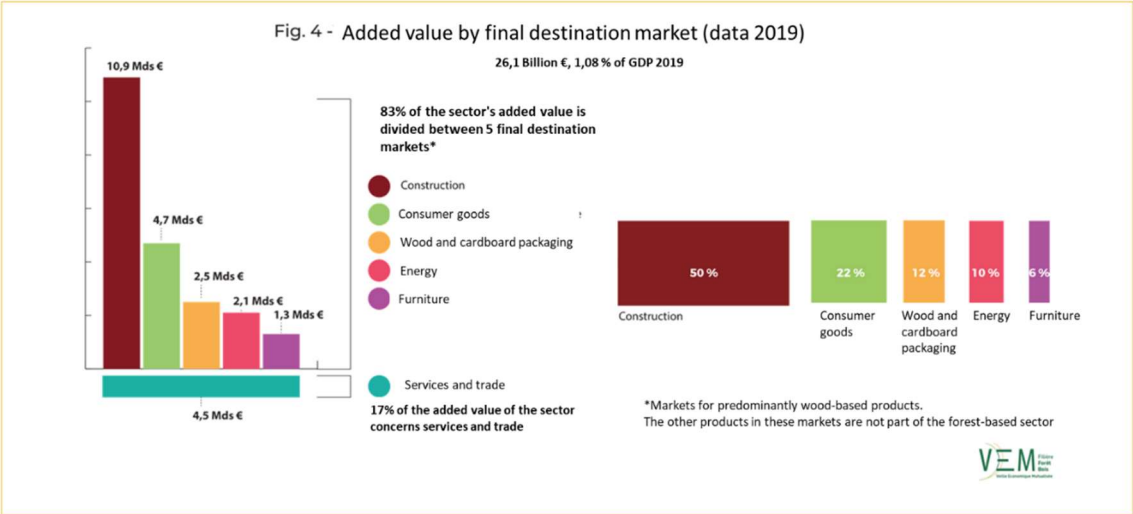


Figure 1: Value added by final destination market (data 2019)

In recent years, environmental issues have left their mark on the current management of the wood and furniture companies. Corporate social responsibility, sustainability and circular economy are well known concepts in the furniture sector. This shift has been speeding up in the early 2010's with the launch of new regulations regarding indoor air quality, an extended producer responsibility for furniture products which is still unique in Europe and the progressive deployment of environmental labelling. At present the creation of an extended producer responsibility scheme for construction waste is going to push forward incentives in terms of circular economy for wood building products.
Composed mainly of SMEs and very small companies (83% which 9 or less employees in 2017), the furniture sector is facing competition from abroad and has seen its production volumes fall by more than 40% over the last fifteen years. However, it has benefited from a rebound driven by the "made in France" sector since 2015, which has allowed volumes to stabilise. The sector is growing in exports, driven by the image of the "French art of living" and "made in France". The SMEs and ETIs in the sector continue to concentrate in order to become more competitive. The sector employs around 35 000 people, which is a number that have been decreasing by 6% between 2016 and 2019, and 78% of them work in SMEs of less than 250 employees.

In order to help the sector to strengthen the attractiveness of the sector and the problems of the ageing of the employee pyramid different topics need specific attention: integrating environment aspects such as circular economy in the business models of companies, modernisation of the industry through further

10 Source : VEM : *https://vem-fb.fr/index.php/chiffres-cles/valeur-ajoutee-et-emploi*

digitalisation of management and processes, strengthening the learning culture. Therefore, the training paths under development and the European platform developed within ALLVIEW should serve these issues.

Germany

Mapping

	Public Authorities	Business	Trade Unions	Research Institutions	Education & Training Institutions	Other Stakeholders
High Influence/ High Impact	**Public employment Services Federal Employment Agency** (Bundesargentur für Arbeit, 156 local employment agencies in total) **Competencies:** -Regional policies for the unemployed and for the labour market -Training of unemployed Support for companies when engaging unemployed -Regional, specific premiums and subsidiary help **Federal Ministries and Agencies Federal Ministry of Labour and Social Affairs Federal Ministry of Education and Research** **Competencies:** Policies and Politics	**National sectoral Business Associations (W&F) HDH** (Main Association of the German Wood Industry, umbrella association) **BDF** (premanufactured building) **VDM** (furniture) **BIEF** (interior work) **VDP** (parquet) **VFF** (windows and facades) **HPE** (wooden packaging, pallets) **BVB** (funeral supplies) **iba** (office supplies) **didacta** (education economy) **DeSH** (sawmills) **Competencies:** -Institutional Relationship Lobbying and advocacy -Capacity building -Technical-regulatory lobbying	**IG Metall Competencies:** Regional Collective Labour Agreement for W&F sector Protection of workers Lobbying and advocacy	**Fraunhofer WKI** **Competencies:** -Process engineering, natural fiber composite plastics, surface technology, wood and emission protection, quality assurance of wood products, material and product tests, recycling processes, use of organic building materials, wood in construction. **Federal Institute for Materials Research and Testing (BAM) Competencies:** research, assessment, advice for safety in technology and chemistry	**Federal Institute for Vocational Education and Training (BiBB) Competencies:** Vocational, Education and Training Definition and Update of the Curricula	**Employers W&F** (individual) Branding Engaging people + choice of CVET / professional development of workers Choice of machines, products, markets…

		-Promotion and support of the Belgian Wood and Furniture sector -Networking and info dissemination				
High Influence/ Low Impact		European sectoral Business Associations (W&F) EFIC (furniture sector) EPF (wood panels) FEP (parquet) EOS (sawmills) CEI Bois (wood industry) EFV (premanufactured building) etc... Competencies: -Lobbying and advocacy -Networking and info dissemination among National Associations Technical-regulatory lobbying Institutional Relationship with EU				
Low Influence/ High Impact	Federal Ministries and Agencies Federal Ministry of the Interior, Building and Community Federal Ministry for Economic Affairs and Energy Federal Ministry of Food and Agriculture Competencies: Policies and Politics	Regional business associations VHK (Baden-Wuerttemberg) VHKBT (Bavaria and Thuringia) HKNB (Lower Saxony) HKN (North-east) AGV HK NRW (North Rhine-Westphalia) HO KU (Rhineland-Palatinate) VHKS (Saxony) LVSAHK (Saxony-Anhalt) VHK Herford (Westphalia-Lippe)		IHD (Institut für Holztechnologie Dresden gemeinnützige GmbH) Competencies: Application-oriented research on the use of the raw material wood, its processing into materials and finished products made from it. Holzbau Deutschland-Institut	VET and TVET Centers (W&F) Competencies: Vocational, Education and Training Continuous Professional Development Networking with the local business environment Higher Education Various Universities	

		Competencies: - Institutional Relationship - Lobbying and advocacy - Capacity building - Technical-regulatory lobbying - Promotion and support of the Belgian Wood and Furniture sector - Networking and info dissemination		**Competencies:** Timber construction	Forest and Wood Science (M.Sc.) Industrial engineer in the wood industry (M.Sc.) Wood technology (B.Eng.) Wood and Furniture Technology (B.Eng.) Wood and Bioenergy (B.Sc.) Timber Construction and Energy Efficiency (M.Eng.) Wood and wood-based materials technology (B.Eng.) **Competencies:** -Research and Innovation -Training -Cultural dissemination	
Low Influence/ Low Impact				**EPH** (Entwicklungs- und Prüflabor GmbH (EPH) **Competencies:** Test orders and services for industry and trade **TU Dresden** (Institute for Steel and Timber Construction) **Competencies:** -Steel and timber construction -Sustainability -Hybrid construction		**FSC Germany, PEFC Germany, WWF Germany, ...** **Competencies:** Lobbying and advocacy Sustainability and circular economy **Parents and students (individual)** Choice of studies and schools

SWOT

	Strengths	Weaknesses
Internal	• Pronounced forestry • Long tradition of woodworking and furniture • Very high quality standards, good structures, clear processes • Kitchen and furniture "made in Germany" in great demand; large market share, well integrated into the European market; good training in this area (less skilled labour shortage) • W&F Industry and their professions in digital change and are becoming more and more attractive for young people; very high takeover rate among apprentices • Promotion of energetic building renovation • Awareness of sustainability, CE, inclusion and certifications in the sector • Prefabricated wood-buildings have a growing market share every year • imm cologne (furniture fair) • Sectoral and regional associations	• Shortage of skilled workers in relation to the on-site assembly professions (prefabricated buildings sector) • Shortage of skilled workers in nearly all sectors • Many small and medium-sized companies that lack the means to invest in digitization, modernization and their own training; ageing workforce • Poor visibility of the craftsmen occupations • Companies outside of larger cities or their surroundings less attractive • Sector not very appealing for women • High demand for skilled labour and strong competition from other sectors for technical profiles (e.g. chemistry, automotive industry)

	Opportunities	Threats
External	• Broad awareness of sustainability, CE, certifications, wood construction, local wood, climate protection, etc. in the society; wood = climate-friendly • Professions with wood as a climate-friendly product are becoming more attractive for younger people • Growing exports because of quality "made in Germany" • great demand in the construction sector; prefabricated buildings are more and more popular, because of quality, standards, it is climate-friendly and construction is fast • many Germans have invested their money in their homes instead of vacations (because of Covid) • digitalisation of training material and training offer is increasing at the European level • Development of new sustainable, recycled, recyclable or functionalised materials, development of new digital technologies for production processes, data management, systems' integration • 60% import of furniture (cheaper than German manufacturers) - will possibly improve in the next few years, as transportation costs and salaries in other countries rise and imports will become more expensive	• Foreign trade risks are noticeably increasing for the German economy • The escalating tariff war between the USA and China is causing great uncertainty in international business • Further increases in standards and government regulations lead to higher costs, which increase prices accordingly and thus make prefabricated buildings less attractive • Difficulties in finding and sharp rise in costs of raw materials • Competition with EU and non-EU countries with lower labour costs • Ageing labour force (demographic change in Germany in general) • Development of e-commerce is disrupting small, non-digitalised companies and increasing pressure on prices

Outline Analysis

The German timber industry is a role model for a climate-friendly, competitive and sustainable economy. It makes a significant contribution to a healthy and sustainable living environment. Together with politics and society, it stands for optimal economic framework conditions as well as high ecological and social standards. The German wood and furniture sector currently includes 2.300 companies (only counting those with at least 20 employees), 200.000 workers and a has total turnover of 43 billion euros. The sector is structured in many associations starting with the HDH (Main Association of the German Wood Industry) as the umbrella association including the regional and sectoral associations. Their main tasks are economic, collective bargaining and social policy issues of the wood industry in Germany, Europe and internationally and commitment to ecologically and socially sustainable economic practices.

Nearly half of the total turnover of the W&F industry is generated by about 1.000 companies (with 100.000 employees) of the furniture industry with a total turnover of 20 billion euros. Especially bigger companies of this sector with at least 50 employees (468 companies) have most of the industry's turnover (17.2 billion

euros). The largest division is represented by the manufacturers of kitchen furniture. With only 70 companies they generate a turnover of 5.35 billion euros of which 2.12 billion euros are generated from exports giving the German manufacturers of kitchen furniture an exceptional position in Europe. The manufacturers of kitchen furniture are followed by office and shop furniture, dining, living room and bedroom furniture, upholstered furniture and mattresses. Almost a third of production of the furniture sector is exported. France is the largest foreign market, followed by Switzerland, Austria and the Netherlands. The United States, China and Russia are among the most important non-European markets. With the new RAL label of origin "Furniture Made in Germany" launched in summer 2020, the German furniture manufacturers want to open up further sales opportunities. The geographical guarantee of origin stands for quality furniture from German production. Nevertheless, there is also a high shortage of skilled workers in this area, as seen in the German wood industry in general. This results from the lack of interested trainees (other industries, e.g. chemistry, are more interesting/offer more money and local wood companies are near the forest, therefore often far from bigger cities) and the demographic change. Therefore, in addition to the current shortage of materials, there is also a shortage of personnel in this industry. Especially in the field of craftsmen the gap becomes bigger and bigger, particularly in the area of dual training for skilled craftsmen such as wood mechanic, carpenter and cabinet maker.
The training factory (furniture) in Löhne is a major step in increasing interest in these professions and making it easier for companies to train young people. A large number of different training modules for six professions are expected to be offered from the fourth quarter of 2022 and around 200 interested junior employees and apprentices are expected every year. Up to 60 people can be qualified there at the same time. Accommodation options should include a boarding house, which is to be built on a separate site nearby. Here, an exchange with the ALLVIEW project can be of high interest and could serve as a role model.

The wood construction area generated a total turnover of 8.11 billion euros in 2020, mainly limited to the national / German speaking market. In order to reduce CO_2-emissions and help the climate-friendly building with wood, the government increases its funding continuously as well as remove existing barriers. Renovation and refurbishment work is also increasingly being promoted. In wood construction sector, prefabricated constructions are becoming more and more important in Germany. In 2020, the share was bigger than 20% of all new constructed buildings, increasing every year.

To help the sector becoming more attractive to younger people again, modernisation of the industry through digitalisation and new processes and strengthening the learning culture are necessary. Therefore, ALLVIEW with its training paths and its European platform can contribute to these issues. Giving companies and young people in this sector the opportunities to participate in international exchange and learning is another very interesting aspect for the German wood and furniture industry.

Allview

3

Comparison of different regions

3. Comparison of different regions

Internal Aspects (strengths and weaknesses)

Similarities in strengths

Industry

Belgium, Germany and France all report a long tradition of woodworking and furniture-making, while Italy and Poland report having highly experienced and skilled employees working in the sector.

Belgium, France, Poland, and Italy note that their F&W sectors are dominated by smaller companies, and the former two also add that large companies are not very numerous.
Italy, Slovenia, and Belgium all mention a high degree of flexibility among their companies. In the case of Italy and Belgium, this is partly attributed to the aforementioned small size of many of the companies in the field, where larger companies may find it harder to react quickly to market changes.

The Netherlands, Italy, and Spain all describe a tendency for the sector to embrace and/or drive innovation.

Both Italy and Germany emphasise the existence in their regions of highly respected trade fairs for furniture: in the case of Italy the *Salone del Mobile* in Milan; in Germany *imm cologne*.

Labour market

Both the Netherlands and Belgium report that job opportunities in the sector are sufficient or even increasing.

Belgium, Slovenia, and Spain all report the use of social inclusion measures to help various groups with a distance from the labour market (the disabled, the hard-to-employ, etc) to begin working in the W&F sector. In the case of Belgium, the sector's inclusion of such people is far above the average for other sectors.

Education

Both Belgium and France report a significant number of schools which offer W&F education.
Both the Netherlands and Belgium report a high number of opportunities for students in the sector to gain practical experience, in the Netherlands through a high number of internships and in Belgium through extensive use of dual learning.

Both the Netherlands and Slovenia report a high or increasing focus on digitalisation in F&W education.

Slovenia and Poland both report having excellent teaching staff for W&F education.

Synergies

Poland, Spain, Slovenia, and Italy report good relationships between companies, education institutions, and/or research centres.

Other

Slovenia, the Netherlands, Spain, Germany and Italy all report significant awareness of and emphasis on Circular Economy, both in the case of education (Slovenia, Netherlands), in the case of industry (Netherlands, Spain), and in general (Italy).

Both Italy and France report the existence of measures in place to support domestic consumption of home furnishings, for example through a bonus scheme.

Similarities in weaknesses

Industry

Italy and Poland both note that most of the companies in the industry in their regions are family-owned and thus tend to be reluctant to bring in outside managerial experience.

Labour market

The Netherlands, Belgium, France, and Germany report labour market shortages and recruitment difficulties. This is fed into by the problem of an ageing workforce, something reported by Slovenia, Germany, and Belgium.

Related to that, Italy, Belgium, and France report problems in trying to attract and young people into the sector. This is also a problem for all those three countries when trying to recruit women. Germany also reports problems attracting women to the sector.

Both Belgium and France report high demand for skilled workers in the W&F sector and high competition with other sectors to get hold of them. The Netherlands states that it is gradually closing this gap but still suffers labour market shortages in the W&F sector.

Other

Both Belgium and France report that while wood is viewed well as an environmentally friendly resource, many people are hesitant to use it due to worries about contributing to deforestation.

Differences

Industry

While Italy and Belgium stress the benefits in terms of flexibility flowing from the fact that many of its W&F companies are small in size, both Belgium and Italy, as well as Poland, note that the prevalence of such small companies makes it hard for sectoral strategies to reach them, as well as reducing their level of innovation. Poland adds that this high number of small companies makes it difficult to implement sectoral strategies.

While the Netherlands reports having many internships in W&F, Belgium on the other hand notes that it suffers a shortage of them.

While Italy expresses as a strength the fact that it has a single representative organisation for the entire country, Belgium, on the other hand, notes its fragmentation on this front as it has 3 different sectoral organisations for the W&F industry within a considerably smaller country.
Despite the fact that Spain, Belgium, and Italy all have examples of very innovative companies, they also have concerns about a lack of innovation. Spain notes that the majority of its firms are not innovative. Belgium sees a difference between some of its larger companies, which are highly innovative, and micro enterprises, which are not. Italy, meanwhile, finds that very few of its startups in the sector are innovative.

Labour market

At the same time as Italy, Belgium, and France have difficulties in attracting young people into the W&F sector, Germany sees the sector there becoming increasingly attractive for young people to work in.

Italy reports weak focus on disabled and frail people in the W&F industry while Belgium, Slovenia, and Spain had all reported positively about the use of measures to include such people, with Belgium specifically noting a high level of their inclusion.

Education

Spain reports a difficulty in employing dual learning due to factors such as most companies being small, resulting in no dual learning actually taking place. This comes in contrast to the sector in Belgium, where dual learning is used extensively.

Slovenia reports that its study programs for W&F rarely include modern technologies such as alternative and virtual reality. This comes at the same time as the Netherlands reports that its own F&W training have more and more focus on the modern, such as new techniques, new trends, and digitalisation.

Synergies

While Poland, Spain, Slovenia, and Italy have remarked on good relationships between industry and academia/research as regards the W&F industry, Italy and Poland also note that that relationship is irregular and does not follow the open innovation model well.

External aspects (opportunities and threats)

Similarities in opportunities

Industry

Italy, Spain, Belgium, and France report increasing application of Industry 4.0 and use of digital technologies for production processes. In addition, Belgium, Slovenia, and France note how many of their SMEs are able to provide extra services to customers through application of Industry 4.0, such as selling customer-specific customised products.
France, Belgium, and Italy all report a boost to the sector coming out of Covid-19 lockdowns as the public have started investing more heavily in their homes and furniture.

Germany, Italy, and France all report that their national W&F production is increasingly attractive for importing countries abroad due to good reputations in it which they possess.

Labour market

Both Belgium and Spain report a high demand for skilled professionals to work within the W&F industry.

Education

Belgium and France both note that their training material for the sector is being digitalised.

Synergies

Both Slovenia and the Netherlands report the opportunity to increase cooperation between VET schools and HE institutions.

Other

Spain, Germany, Belgium, and France report general widespread awareness of Circular Economy and its importance. On a similar note, Italy reports a high level of innovation in business models on the basis of Circular Economy.

Both Belgium and France report broad awareness of green labels on products, while Italy reports simply that it has such a label.

Poland and Slovenia list as opportunities that they are among the most forested countries in Europe, with forests covering respectively 30% and 58% of their landmass.

Similarities in threats

Industry

Also on the topic of costs, Poland, Italy, France, and Belgium report various price pressures which may form a threat to the industry. All of them report an increase in the prices of inputs, that is wood, since mid-2020.
Poland additionally sees a threat in the decline product prices on domestic and foreign markets.
Italy, Belgium, and France report an increasing level of furniture imports, from countries both inside and outside the EU, with whom their countries have very tight competition due to the others' ability to produce with lower costs.

Labour market

Although Belgium and Spain view a high demand for skilled professionals as an opportunity, Slovenia conversely views its reported lack of an educated workforce as a threat.
Spain reports that T-VET has a bad image there, while Belgium reports the same bad-image problem but with regard to dual learning.
Belgium and France both see their ageing workforce as a threat to the industry.

Education

Both Poland and the Netherlands report that teachers not having enough time due to being overloaded with duties is a threat.

Differences

Industry

While Poland, Belgium, Italy, and France all see foreign, non-EU imports as posing a threat to domestic consumption of wood and furniture, Germany views the threat to its industry as coming from the perceived insecurity and risks regarding the escalating geopolitical tensions with China.
Germany also expects the market share of foreign producers in its market to decline in the future due to increasing transport costs from other countries and rising salaries there., in contrast to how Italy, Belgium, and France view the lower production costs in other countries as an ongoing threat.

Labour market

While Belgium and Spain report a high demand for skilled professionals in the sector, Poland experiences having an excess of skilled labour.
While Belgium sees the opportunity to lead many migrants, refugees, and women into the W & F sector, Spain reports very low resources for c-VET for people from disadvantaged backgrounds who might otherwise join the labour market if they could receive specific training.

Synergies

At the same time as the Netherlands and Slovenia describe the opportunity to increase cooperation between VET schools and HE institutions, Spain reports the threat that it has no clear strategy for increasing relationships between VET and HE in the promotion of DT/Industry 4.0.
While Slovenia sees an opportunity to strengthen cooperation between education and business, Spain, on the other hand, views as a threat a lack of sufficient support for building relationships between Industry and HE/Research centres.

Allview

4

Desk research into policies

4. Desk Research into Policies

Description

In order to broaden the focus of this Deliverable out from solely the project's constituent regions, desk research has been carried out into other regions of Europe. This has the advantage of giving a more representative of the situation across Europe, given that the partners that make up the consortium primarily represent countries which have been founding member of the European Union and thus come from a rather different economic context to those countries which may have joined in more recent decades. For each of the countries below, this desk research focuses on initiatives established within the three thematic areas of ALLVIEW, as well as how the education system there is structured and what paths may be followed in order to begin a career within the W&F industry.

Lithuania

Industry 4.0

The EC "Monitoring Progress In National Initiatives On Digitising Industry" country report on Lithuania draws a dynamic development with regard to the digitalisation in the manufacturing sector (cf. *EC 2019* and SWOT in Table 1). There are a multitude of different policy measures and initiatives in form of projects to support the development including (initial and continuing) skills development and VET skills match improvement (cf. details in *EC 2019*). The furniture sector contributes 2.5% to GDP and is highly export oriented (88%). In addition, ICT services and Hi-Tech engineering industry together contributing 18% to GDP are a strong complementary force supporting digitalisation (*LT Chamber of Commerce 2019*) .

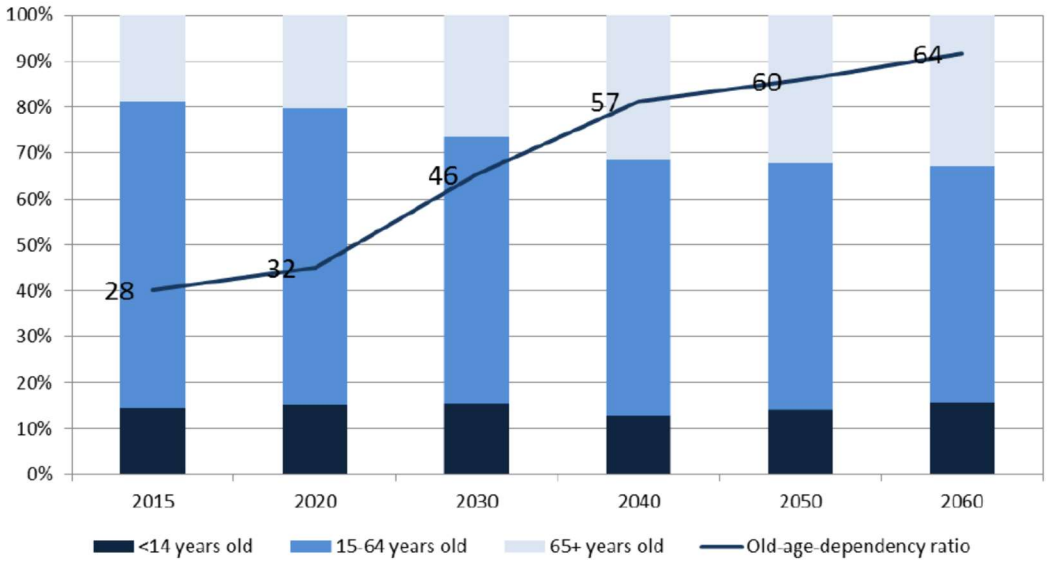
*Table 1: SWOT of Lithuania on digitalisation (*EC 2019*)*

Strengths:	Weaknesses:
• The manufacturing sector represents an optimal share in the Lithuanian economy (~ 20% of GDP) • Manufacturing companies are well integrated into international value chains (industrial production exports> 60% of GDP) • Excellent performance in Digital Public Services. • High performance in Electronic information sharing, Selling Online cross-border, Online service completion and Ultrafast broadband take-up. • First in Europe (2nd in the world) rating for attractiveness in global manufacturing according to Manufacturing risk index (2018). • Excellent growth of economy, fuelling increasing activity in industry (especially manufacturing).	• Lagging behind the EU average in Human Capital. • Lagging behind in ICT Specialists, Online Shopping and Open data. • Labour productivity increased only by 14%, while labour costs increased more than 40% in past 5 years. • Industry is dominated by SMEs with low-level of technology readiness.

Opportunities:	Threats:
• Attract and develop high-value added industries to Lithuania, such as Fintech. • Continue support and development of logistics industry digitisation. • Increase speed of digitisation of businesses and public services.	• Regulatory framework in Lithuania still needs to be improved to support digitisation of industry. • Rapidly increasing wages can reduce competitiveness of enterprises.

Ambient/Active Assisted Living

First of all, this topic concerns Lithuania from a demographic point of view as the fertility rate is at 1.6 births per woman and increasing living standards are leading to a higher percentage of elderly people in the population (*World Bank 2020*). Hence, in the future there will be a smaller workforce available for the manufacturing sector and more assisted living products needed.



Source: Eurostat, proj_15ndbims [extracted 16.5.2019].

Figure 2: Population forecast by age group and old-age-dependeny ratio. This indicatior is is the ratio between the number of persons aged 65 and over (age when they are generally economically inactive) and the number of persons aged between 15 and 64. The value is expressed per 100 persons of working age (15-64).

A *Latvian-Lithuanian Interreg Project* addressed the topic from the "care perspective", rather than assisted living. Moreover, there is a recent *Cost Action* (Network on Privacy-Aware Audio- and Video-Based Applications for Active and Assisted Living) connected to Riga Technical University with further details on *goodbrother.eu*. In summary, no main platform or institution on AAL in Lithuania could be identified, the link to VET education programs could not be made. It would be key to establish contact to the cost action for further information and connection to VET programs.

Corporate Social Responsibility & Circular Economy

Corporate Social Responsibility & Circular Economy related issues gained substantial momentum among Lithuanian companies in recent years (*Miliūnė 2021*). The *LAVA association* unites engaged businesses and experts. It would be key to establish contact to LAVA for further information and connection to VET programs.

Education in Wood & Furniture

According to the EC Country Report Lithuania 2020, the government is "*continuing to modernise its vocational education and training (VET) system. The consolidation of the providers of VET continues. The number of public VET providers is planned to decrease further from 61 in 2019 to 56 in 2020. The introduction of the modular VET curriculum is advancing well, with around 70% of VET students studying in modular programmes in 2019. However, enrolment in upper-secondary VET is among the lowest in the EU, with just 27.4% of all upper-secondary students in 2017 undertaking VET programmes vs. an EU average of 47.8%. This highlights a substantial under-utilisation of the potential of VET to contribute to addressing national and regional skills challenges and mismatches in Lithuania*". The predominantly school-based VET system is being reformed towards more practice oriented and apprenticeship schemes. However, the VET system is not yet sufficiently accounting for industry 4.0, AAL and CSR/Circular Economy and teachers and trainers lack up-to date knowledge, teaching and training skills (*Cedefop*; Qualifications and Vocational Education and Training Development Centre (2019) Vocational education and training in Europe: Lithuania). These lacks are accounted for through teacher training programs. However, the teachers being neither professionals from the manufacturing industry nor experts in these recently emerging topics other and more industry connected mechanisms should be introduced.

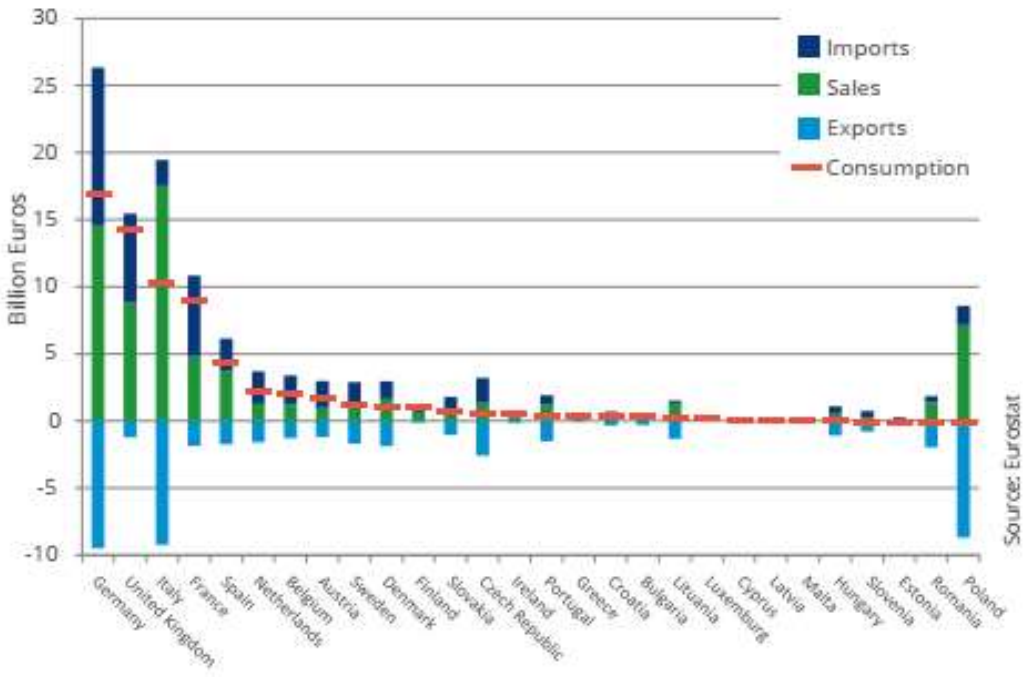


Figure 3: Furniture Production, import and export Values by Member State. Circular Economy Opportunities In The Furniture Sector, EEB, 2017

Denmark

Industry 4.0

According to a branch analysis carried out in 2019 by the Carpenters' Education Insitution11, Danish W&F companies are increasingly automating processes and usage of Programmable Logic Controller (PLC) technology is now widespread. Computer Numerical Control machines have been in use for many decades, though increasingly more new machines are coming into use which are capable of performing ever more advanced processes. While the companies spoken to for that analysis had different levels of intention to digitalise and introduce robotically managed production, all of them had invested in new machines and/or robots.

The Danish government has taken various steps to promote digitalisation and industry 4.0, one element of which has been various Digital Strategies since 2001, the most recent of which for the period 2016-202012. One aspect of this relevant to business is the commitment to make more useful public data available to the private sector, including data on waste, which may clearly be of help in the promotion of Circular Economy (see next section).

Another is the government agreement on "Initiatives for Denmarks Digital Growth".13 Perhaps the most interesting of these is the establishment of the SME:Digital programme to assist SMEs in their digitalisation through funding of digitalisation advice services, the building of links and communication between less and more digitalised SMEs, and digital competence-raising among company leaders, among other actions. The agreement also established a Digital Hub for Denmark and a Technology Pact to raise digital competencies.

The 6 Regional Development Agencies (erhvervshus) of Denmark work together on "DigitaliseringsBoost", a programme for spurring on innovation in digitalisation and industry 4.0 among SMEs. It does this by offering funding and practical help to teams, consisting of at least two companies and one knowledge institute, in order to enable them to develop products and solutions.

Active/Ambient Assisted Living

The Nordic Council of Ministers, through its project "Nordic Welfare Solutions", carries a focus on Ambient Assisted Living (AAL), often referred to as "Assistive and Welfare Technology" in Denmark. It works to showcase the Nordic region's advanced progress in AAL to an international audience. Among the various things they promote, those perhaps relevant to the W&F industry are: the use of digital sensors built into beds which serve to inform care staff when a person is sleeping and when not, as well as recording their movements in bed and estimating sleep quality; doors equipped with sensors and alarms; interior solutions to allow the height of kitchen and bathroom surfaces to be adjusted according to the height of their user; and access ramps for those who struggle with steps.

The Danish government has in turn set up a "Council for Safety-Creating Welfare Technology", whose task is to follow developments in AAL solutions and keep the relevant government minister informed of what solutions might be interesting for wider implementation. As part of this, the Council submits a yearly list of promising technologies.

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11 https://www.snedkerudd.dk/media/2408/brancheanalyse-af-trae-og-moebelindustrien-analyserapport-februar-2019.pdf

12 https://digst.dk/media/16165/ds_singlepage_uk_web.pdf

13 https://www.regeringen.dk/media/4922/aftaletekst-om-initiativer-for-danmarks-digitale-vaekst.pdf

Denmark also has its own trade organisation for, Danish.Care, which represents the sector by allow the best possible framework for the technology, sharing knowledge about, and supporting cooperation to implement it. Together with the Danish Technological Institute, Danish.Care has since 2008 run a national network for AAL under the name CareNet, featuring: public authorities of all levels, producers and delivers of AAL technology, care centres and organisations, interest organisations, and research and education institutions. Danish.Care also runs the Health & Rehab Scandinavia trade fair, which showcases AAL technology.
Lastly, a further factor which serves to raise the profile of AAL is the 3-year bachelor's degree in it by the name of "Health and Welfare Technology" which is taught at Odense University.

Circular Economy

Makers of wooden products in Denmark are increasingly being asked to provide documentation of the origins and quality of their products. In light of this, the industry's increasing focus on Circular Economy is important.

One noteworthy initiative in this area is "Green Circular Conversion" from the Danish Board of Business Development, an initiative of the Danish government. This is a national project which includes a broad variety of industries in efforts to support Danish SMEs in the development and implementation of green and circular business models. It attempts to achieve this by offering free theoretical and economic support to businesses interested in becoming more circular. This can include: development of a new business model; offering insight into the company's current resource use and environmental footprint as well as projections under the new more circular business model; professional consulting; and help preparing for stricter sustainability requirements from products which will come in future.

The "Nordic Swan Ecolabel" is another initiative that may promote circular economy in the wood & furniture sector. The Nordic Swan Ecolabel is a product label used across the Nordic countries to mark items that meet certain sustainability criteria which was brought about by the Nordic Council of Ministers in 1989. In 2021 it introduced new Circular Economy criteria for use of its label on indoor and outdoor furniture, including playground and park equipment. These tightened criteria include: use of wood from legal, traceable, and largely sustainably managed sources; use of more durable wood; circular design to promote resource recovery; use of plastic and metal parts of which a high share is recycled material; and limits on energy consumed in the process of making wood-based boards and laminate.

Furthermore, efforts at promoting Circular Economy within the furniture sector are taking place through "3daysofdesign", Denmark's annual design fair, the 2021 edition of which is set to take place under the name "Circular Furniture Days". This event is run by the Lifestyle & Design Cluster, an industry cluster and innovation network established under the Danish Ministry of Higher Education and Science which represents the furniture, interior, textile, and fashion industries. At the event, success stories will be shared of innovative use of waste products, minimalistic resource use, and recycled material inputs, as well as discussions of how to implement a more circular business model.

Education in Wood & Furniture

When discussing the W&F industry, a couple of key organisations recur repeatedly as main actors involved in very many aspects of the sector. The first of these is the Confederation of Danish Industry (abbreviated DI), a business and employers' organisation, which contains a Wood and Furniture (DI/TMI). The second is

the United Federation of Danish Workers (3F), a trade union. Both will repeatedly be referred to in the following section.

According to the branch analysis from the Carpenters' Education Insitution14, although the number of employees at the time had been rising, the number with a trade education were falling. Vocational Education and Training in Denmark is split into 3 categories, as may be seen in the chart further down. These are VET for the young, VET for adults, and VET for those who wish to combine it with gymnasium-level education. After completing a VET course, it is possible to proceed onto what are called Academy Profession Programmes, although no W&F-oriented courses seem to exist at this level yet.

Relevant courses for those wishing to work in the W&F industry include: Machine Carpenter, Production Assistant, Furniture Upholster, Furniture Carpenter, Woodworking Construction Education, Organ Builder, International Carpenter, Trade Assistant, Machine Technician, Car Seat Maker, and others. These are primarily VET courses available for study in multiple locations across Denmark. The first three of the above-listed courses have actually been designed with input from the W&F trade body DI/TMI, implying that a certain degree of work has already gone into closing the skills gap in the W&F industry in Denmark.

A number of VET short courses are also available for those wishing to improve their skills in specific areas. These are gathered under the acronym AMU, or "Labour Market Education". There exist 30 of these courses aimed at current or future workers in W&F, categorised into the following 12 thematic areas: Glue techniques; Surface handling; Servicing of machines; Computerised Numerically Controlled (CNC) machines; Computer Aided Design (CAD); Growth of trees and cutting shapes; Measurement techniques, drawing, and price calculation; Furniture and building collections; Assembly; Renovation of old furniture; Presentation of organs; Course packages for the unemployed; Work environment; and Home installation. Of particular relevance to Circular Economy is the Renovation of old furniture theme/course, which lasts 5 days in total.
A number of initiatives created to increase the competence levels of Danish W&F workers, and thus the competitiveness of the industry, have come out of mutual agreement between the two key players DI/TMI and 3F. The first of these is the "Wood Education and Development Fund". This serves to provide support to activities which promote the industry's competitiveness, image, and ability to recruitment. Among other things, it has previously funded: a national W&F competence centre, guidance in how to train trainees, study trips abroad, and analyses of the wood industry in foreign, wood-exporting countries.
A further joint initiative of DI/TMI and 3F is an agreement signed in 2020 in which various rights for workers in the W&F industry are agreed on. In terms of education, these include that certain workers within the industry will have the right to 2 weeks of paid leave per year in order to follow training and further education relevant to their work in the sector. The two parties to the agreement also agree to make support available to those wishing to study, subject to an application to the Confederation of Danish Industry. Companies are also recommended to promote competence development to their staff.

Also from DI/TMI and 3F, the "Wood and Furniture Industry Competency Fund" supports education which can be used within the W&F industry, including paying workers for the (abovementioned) 2 weeks of leave they are allowed each year. This leave also accumulates over 3 years, such that a worker who has worked for 2 years previously without taking any paid educational leave is able in the third year to take 6 weeks of paid leave in which they follow a relevant course.

14 https://www.snedkerudd.dk/media/2408/brancheanalyse-af-trae-og-moebelindustrien-analyserapport-februar-2019.pdf

A further subsidy for those already working who wish to improve their skills is "State Educational Support for Adults". As does the above Competency Fund, this allows them to receive further compensation for wages which they would otherwise miss out on whilst taking time off work to study, subject to certain conditions such as being at least 25 years old, having worked at least 26 weeks, attending an accepted course, and others, varying by the type of course. This subsidy is more general and does not only focus on the W&F industry but on education in general, although it is still available to those in W&F and may be combined with support from the Wood and Furniture Industry Competency Fund.

Romania

Industry 4.0

The manufacturing added value in the economy (% of GDP) accounted for 19.6% in 2018. Moreover, medium high-tech and high-tech industries represented 37.9% of the manufacturing added value. Although the Romanian government has developed a digital agenda in 2015, this does not relate specifically to the digitalisation of industry.

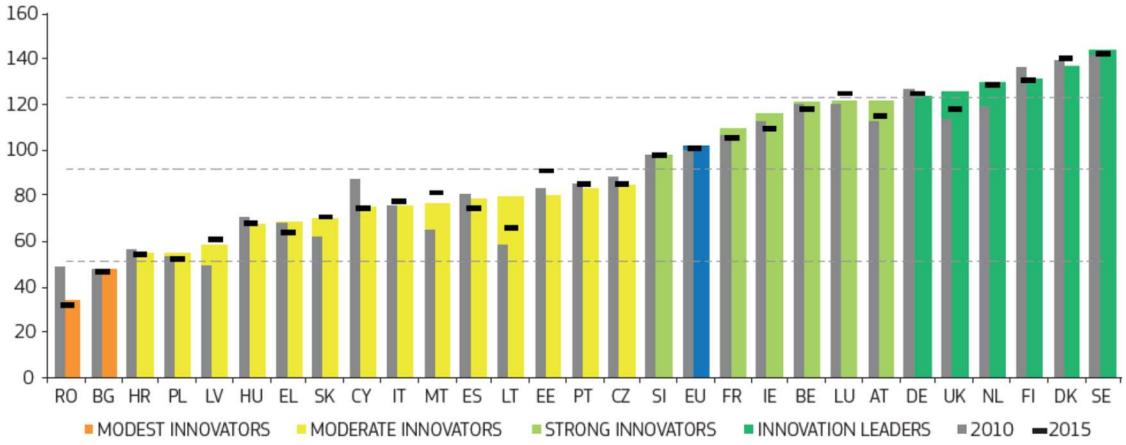

Figure 4: European Innovation Scoreboard (EC 2017 in EC 2019)

The EC "Monitoring Progress in National Initiatives on Digitising Industry" country report on Romania draws a mitigated portrait of the country that "has some competitive strengths which could help develop the Industry 4.0 in the country. The IT sector in Romania is very developed and the country has a highly skilled workforce in this sector.6 UiPath, a Romanian IT company, is one of the success stories in the sector and was listed in a top 100 digital champions in Europe developed by the Financial Times" (EC *2019*). However, as shown in Figures 1+2 as well as in the SWOT in Table 1, there are supstantial challenges that hamper the digitalisation development in the country.

This concerns especially skills development still characterized by a considerable skills mismatch. In this context two training initiatives adress these issues an focus on employers and entrepreneurs "Start Industry 4.0" and citizens in general "Coalitia Skills4IT". According to the ICT Monitoring Tool, Romania is planning ICT Investments under ESIF with relevance to smart manufacturing research and dissemination with a total budget of 250 million Euros (EC *2019*).

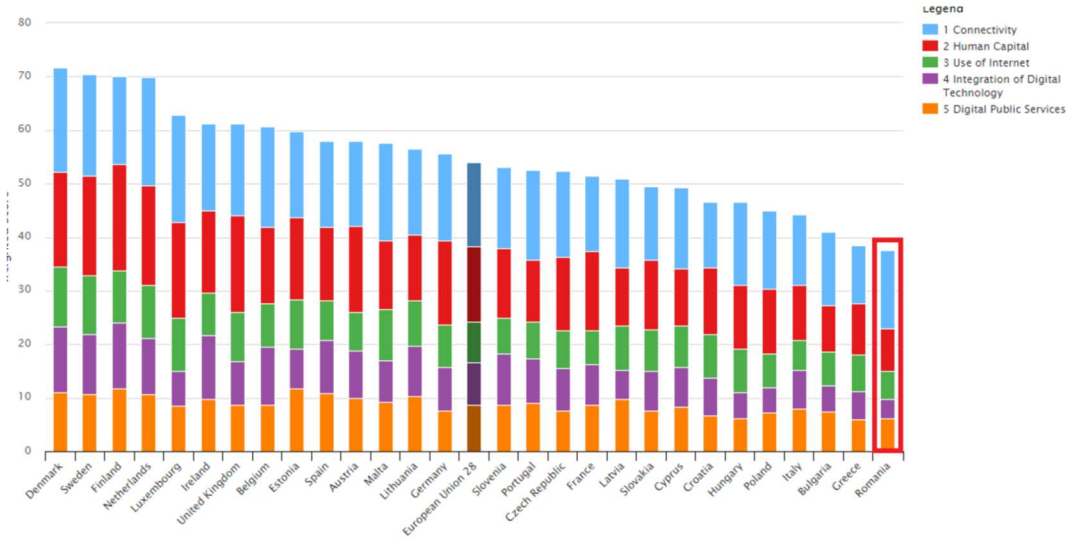

Figure 5: Digital Transformation Scoreboard (DESI 2018 in EC 2019)

Table 2: SWOT of Lithuania on digitalisation (EC 2019)

Strengths:	Weaknesses:
• Strong ICT sector (contributes to 6-7% of the country's GDP) and skilled workforce in the sector • Strong cluster organisations that are competitive nationally and internationally and that have formed centres of excellence in some areas (e.g. ICT)	• Mismatch between the education and the market needs • Digitalisation of the industry has been bottom-up rather than top-down • Weak results in relation to the digitalisation (ranks 28th in the DESI index) and performs below EU average for many of the dimensions • High bureaucracy and lack of coordination at governmental level
Opportunities:	**Threats:**
• European and international developments regarding digitalisation of Industry • Adherence of industry players to existing and future EU cooperation schemes • Emergence of new value chains	• The regulatory framework in Romania still needs to be adapted to the digital age. • Absence of a national strategy for digitalisation of the industry as well as slow implementation of the actions planned in the Digital Agenda for Romania • Delay in adapting to the digital economy • Failing to prepare people for the upcoming transformation of the labour market

Ambient Assisted Living

First of all, this topic concerns Romania from a demographic point of view as the fertility rate is at 1.8 births per woman and increasing living standards are leading to a higher percentage of elderly people in the population (*World Bank 2020*). Hence, in the future there will be a smaller workforce available for the manufacturing sector and more assisted living products needed.

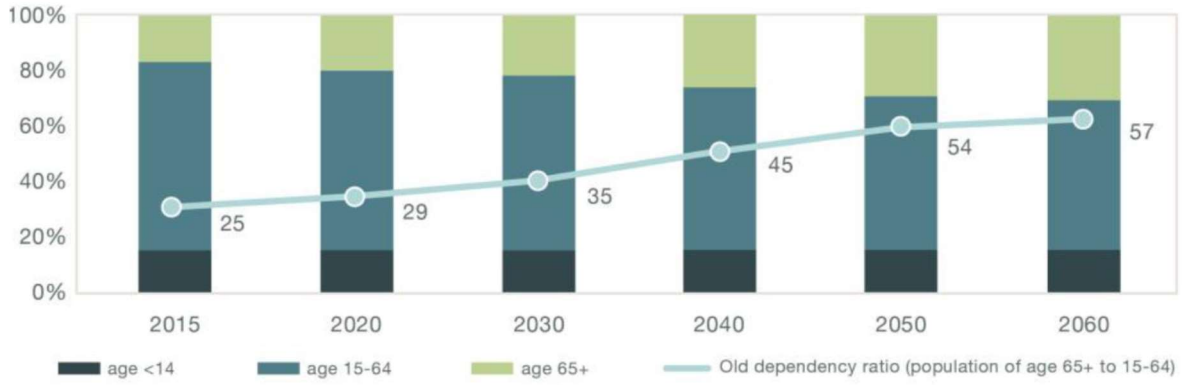

Figure 6: Population forecast by age group and old-age-dependeny ratio. This indicatior is is the ratio between the number of persons aged 65 and over (age when they are generally economically inactive) and the number of persons aged between 15 and 64. The value is expressed per 100 persons of working age (15-64) (Cedefop 2019*)*

Romania is strongly connected to the *EU AAL Programme* and participates in *a variety of projects* connected to AAL. Some of these are connected to education and training such as *WisdomOfAge*, but not on VET level.

Corporate Social Responsibility & Circular Economy

Corporate Social Responsibility & Circular Economy related issues gained substantial momentum among Lithuanian companies in recent years promoted through the National Strategy to Promote Social Responsibility 2011 – 2016. However, in the manufacturing industries the concept remains somewhat "blurry" (Pop *2016* and NEA *2016*). A valuable source for connecting CSR to VET was not found.

Education in Wood & Furniture

The predominantly school-based VET system is being reformed towards more practice oriented and apprenticeship schemes. However, the VET system is not yet sufficiently accounting for industry 4.0, AAL and CSR/Circular Economy and teachers and trainers lack up-to date knowledge, teaching and training skills (Cedefop *2019*). These lacks are accounted for through teacher training programs. However, the teachers being neither professionals from the manufacturing industry nor experts in these recently emerging topics other and more industry connected mechanisms should be introduced *(see also EC Education and Training Monitor 2020)*.

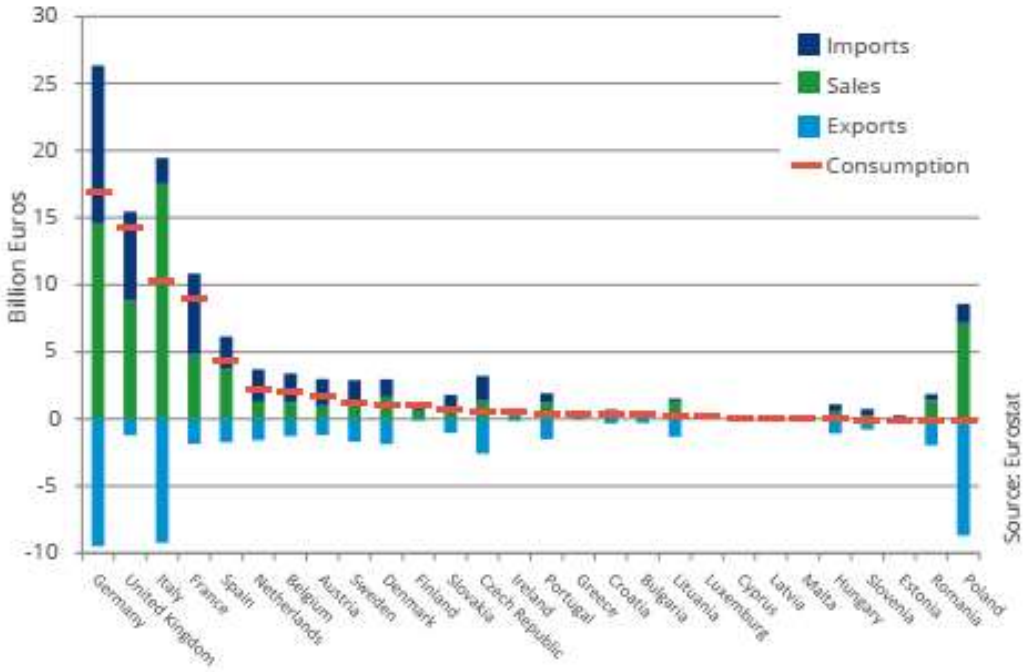

Figure 7: Furniture Production, import and export Values by Member State. Circular Economy Opportunities In The Furniture Sector, EEB, 2017

Austria

Industry 4.0

Concerning the current state of the policy field Industry 4.0 in Austria, as activities and initiatives with major impact are to name the "Plattform Industrie 4.0" and the "Austrian Digital Action Plan". The "Plattform Industrie 4.0" is an association and non-profit organisation that was founded in 2015 at the initiative of the Bundesministerium für Klimaschutz, Umwelt, Energie, Mobilität, Innovation und Technologie (BMK) – the Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation, and Technology – in order to face the many challenges imposed by the digital transformation. The main aim of the association is to facilitate the implementation of Industry 4.0 and to promote cooperation between all relevant stakeholders in the field of Industry 4.0, consisting of companies, academic and research institutions, employers' and employees' representatives, NGOs, and other institutions. It does so through the establishment of expert groups that work on identified focus areas such as research, development & innovation, norms & standards, and regional strategies. As of today (June 2021), the platform consists of more than 60 members with over 600 individuals working in the different expert groups of the association. Technically speaking then, the platform is not a policy or implementation tool in itself but, "a supportive policy coordination hub through which the implementation potentials for Industry 4.0 are identified and prioritised and proposals for further developments are formulated"[15]. An outcome to be highlighted is the development of the

[15] Boog et al. (2019), "Case study on the Plattform Industrie 4.0, Austria: Contribution to the OECD TIP Digital and Open Innovation project".

"Normenkatalog", that includes the most essential current standards and those currently being developed that are relevant for the successful introduction of Industry 4.0 in Austria.

Norms and standards are one of the issues that Austrian companies named as a central need to be resolved by the government in a study on the view of Austrian companies on the matter Industry 4.0 conducted in 2016.[16] In the same study, the perceived second largest barrier to the digital transformation was a shortage of skilled workers, at the same time the framework condition of Industry 4.0 with the highest attributed importance. As it is the responsibility of the Austrian government to create the right framework condition, in 2020 the Bundesministerium für Digitalisierung und Wirtschaftsstandort (BMDW) – The Federal Ministry for Digital and Economic Affairs (which officially bears the issue of digitalisation in its name only since 2018) – launched the "Digital Action Plan Austria". This action plan aims to tackle the issue of digital transformation in a holistic manner. The basis for the action plan is the government programme and it wants to provide a strategic framework for all governmental digitisation topics and stakeholder initiatives, such as the digital transformation of the Austrian economy.

Tackling the challenges imposed by the ongoing digitalisation of our contemporary societies is also the goal of the "Masterplan für die Digitalisierung im Bildungswesen" – the masterplan for digitalisation in education, developed by the Bundesministerium für Bildung, Wissenschaft und Forschung (BMBWF) – the Federal Ministry of Education, Science and Research – consisting of three "pillars": new teaching and learning contents; improved infrastructure, hardware and school management; and improved training for teachers.

Ambient/Active Assisted Living

Similarly to the issue of Industry 4.0, concerning Ambient/Active Assisted Living, the BMK initiated a national platform (also in the form of an association) – the "Plattform AAL AUSTRIA" – on the subject AAL in order to connect the various relevant stakeholders on the matter and to generally promote the visibility of the issue at all levels of public awareness. The promotion of education and training in the field of AAL is here equally seen as one of the main challenges to tackle in the overall framework challenge of demographic change. One of the various activities of the platform is the definition of pilot regions in which AAL solutions are being installed in households and residential units, tested in everyday use and scientifically evaluated. A number of these pilot regions are also being financed by the "benefit" programme, a technology and the major research programme on AAL in Austria, initiated by the Österreichische Forschungsförderungsgesellschaft (FFG) – the Austrian Research Promotion Agency –, which is the national funding agency for industrial research and development in Austria. The benefit programme's main aim is to support innovation and the development of products, processes and services in the field of AAL. The same is true for the joint European "Active and Assisted Living Programme", for which the FFG is also the organisation overseeing the activities of the Austrian partners. The benefit as well as the AAL programme build upon the idea of bringing together different groups of end-users (e.g., older people but also nursing and care service groups, for example) in consortia with business partners, in order to increase both the usability and acceptance of the newly developed products. Both programmes started in 2008 and are the major elements of Austrian (technology) policy on the subject of AAL.

Corporate Social Responsibility & Circular Economy

Concerning the matter of corporate social responsibility, a notable activity in Austria has been the development of the technical rules document ONR 192500 by Austrian Standard, the Austrian (non-

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16 Lassnig et al. (2016), "Industrie 4.0 in Österreich. Kenntnisstand und Einstellung zur digitalen Transformation durch Industrie 4.0 und neue Geschäftsmodelle in österreichischen Unternehmen".

governmental) standards organisation and ISO member body. The document intends to provide practical guidelines for the implementation of the ISO 26000 guidelines on operating in a socially responsible way, which is one of three guidelines that the European Commission has asked companies to use when developing their CSR approach. The technical rules are also the basis for CSR certifications by third parties. In general, CSR is in Austria largely a voluntary process, often associated with service organisations closely tied to companies and the business sector, most notably respACT, an Austrian business council platform for CSR that also organises the TRIGOS awards, Austria's presumably most known business award for responsible business. respACT is also the national coordination body of the Austrian network in the UN Global Compact initiative, the largest initiative on corporate sustainability. As adversary in a sense to respACT appears NeSoVe, a network of non-governmental organisations and employee interest organisations, thereby presenting the perspective of civil society stakeholders on CSR. NeSoVe also majorly criticised the EU's choice of guidelines on CSR as non-substantial and that these would impose no substantial requirements on European companies. A national Austrian action plan on CSR, although available in draft form, after being developed in the wake of the request of the European Commission in 2011 to all Member States to develop national action plans, has not been adopted until today.

Regarding the overall subject of sustainability, a mix of European (EU-SDS), federal (NSTRAT), and national (ÖSTRAT) policies, as well as regional activities and activities of individual governmental departments are named as primarily guiding actions. The holistically designed national sustainability strategy "Österreichische Strategie Nachhaltige Entwicklung" exists since 2010. It is intended as orientation and implementation framework and defines expected challenges, essential fields of action and future priority topics. ÖSTRAT does specifically name CSR as main issue. However, although it does also name "Eco-efficiency and resource management through sustainable mobility, consumption and production patterns" as another main issue, ÖSTRAT does not specifically name Circular Economy. The BMK is currently developing a circular economy strategy whose completion is foreseen for the end of 2021. There does however exist a national action plan on resource efficiency. Apart from that, as governmental initiatives there are to name, the "FTI-Initiative Kreislaufwirtschaft" that supports the development of CE innovative technologies and systemic innovations, launched in 2021, and the Reset2020 initiative. The latter has as goal to support CE actions and to incite cooperation and dialogue between stakeholders. As of now, multiple networks on CE exist in Austria, such as the "Circular Economy Forum Austria" or the "Circular Futures" platform. To note is that these consist exclusively of non-governmental stakeholders.

Education in Wood & Furniture

While educational matters are in Austria traditionally a competency of the federal government, in the primary (ISCED 1) and lower secondary (ISCED 2) levels of education, the individual federal states are responsible for enforcing education and are in the role of being the school providers. Central authority in educational matters is the BMBWF that since 2018 (re)encompasses in a single ministry all levels of the educational system up to the level of higher education. In general, the education system is in Austria a contested and much-debated issue and subject of constant reform debates.
The structure of the Austrian school system is determined by the "Schulorganisationsgesetz"*17* in which schools are doubly divided by age and maturity levels. Schools are divided according to their educational content into general education schools and vocational schools, as well as according to their educational level into primary schools and secondary schools.*18* Starting with the age of 6 and following Kindergarten, 9 years of school education are compulsory for all. Apart from children with special educational needs, for

17 One of the key laws determining Austrian's educational system. Others include the "Schulunterrichtsgesetz", "Schulzeitgesetz", and the "Schulpflichtgesetz".

18 §3 Schulorganisationsgesetz. Accessible via:
https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10009265

whom exist "Sonderschulen" that cover all 9 years of mandatory education, only the first 4 years are the same for all students, during which a "Volksschule" is attended. Afterwards, paths split and either a "Mittelschule", preparing for vocational education, or the lower level of an "Allgemeinbildende höhere Schule" is attended, preparing for higher education. Afterwards, further school education (ISCED 3 and 4) is voluntary and the possible pathways become quite complicated, especially regarding vocational education for which four different types of schools might be attended. The "Berufsbildende Höhere Schule" (BHS) concludes with the "Matura", which entitles to attending universities, universities of applied sciences, colleges, and academies. Students that visited a "Sonderschule" have the possibility to undertake a vocational preparation year and subsequent integrative vocational training. Vocational training is also being received in a "Berufsbildende Mittlere Schule" (BMS), depending on the type of vocational training for a duration of one to four years. Finally, students might visit a "Polytechnische Schule" for the duration of one year, after which a 'classical' dual vocational education follows, consisting of an apprenticeship in a firm (around 80%) with an accompanying visit of a vocational training school – the "Berufsschule" (around 20%).

Concerning policies in education in Austria regarding the furniture and wood sector, the majority of educational pathways are of the vocational education system.*19* There exist a few programmes at institutions of higher education, namely the Bachelors and Masters programme "Holztechnologie und Holzbau" (Wood technology and construction) at the University of Applied Sciences Salzburg, and the two wood-related studies programmes "Holz und Naturfasertechnologie" (Wood and natural fibre technology) and "Master Studium Holztechnologie und Management" (Master Wood technology and management) at the University of Natural Resources and Life Sciences, Vienna. Most options are, however, ascribed with vocational education. Either apprentices follow the dual vocational education path that combines an apprenticeship at a firm with a regular visit of a vocational training school, to become, for example, wood technicians, joiners, or carpenters. Or students follow up on the mandatory 9 years of school education with a visit of one of the different school institutions that prepare its students for a specific occupation: "Fachschulen" equally prepare young people to become e.g., joiners and carpenters, and "Berufsbildende höhere Schulen" with a focus on wood offer educations such as structural and/or wood engineering, or furniture-room design. The Holztechnikum Kuchl merits special mention, as it is a private school/education institution that combines a Fachschule, a Höhere Technische Lehranstalt, and a Werkmeisterschule, offering various educational pathways for about 400 students at a time in the furniture and wood sector. The school is opperated by a non-profit association whose members consist of companies in the Austrian wood industry. The patronage of the Holztechnikum Kuchl Association has been taken over by the "Fachverband der Holzindustrie" – the Austrian Wood Industry Association –, one the main lobbying organisations of the Austrian wood industry. The association understands the core of its activities to be the active work and co-design of essential prerequisites and framework conditions for the wood industry. One major framework condition is education and in particular the necessary ongoing measures in the field of education and qualification to avoid education and training provision lagging behind the demands of the economy. To this end, amongst others, training guidelines that serve as support for the apprenticeship training in the firms are being created, new apprenticeship programmes developed, training programmes redesigned, and initiatives for the promotion and advancement of wood professions undertaken. The latter often in conjunction with "proHolz Austria", a marketing institution of the Austrian forestry and wood industry that also developed the youth campaign "Genialer Stoff" (*https://www.genialerstoff.at/*) to attract new students and apprentices to pursue an educational path in the wood sector.

19 See also the chart on the following page.

Sweden

Industry 4.0

Sweden has set up a strategic innovation programme for the public construction sector under the name Smart Built Environment. "Built environment" in this sense refers not just to buildings, but also to outdoor public spaces, infrastructure, and so on. This programme seeks to promote digitalisation through placing long-term emphasis on it within research, development, and innovation. Other Industry 4.0 aspects are addressed too, including automation.

Within Digitalisation, Sweden has a whole range of structures set up to encourage the digitalisation of various aspects of the country. Firstly, a Digitalisation Commission exists in order to assist Government Office in the development of digitalisation policy. Next, there is a Digitalisation Council which works under the oversight of the Digitalisation Minister to also help develop digitalisation policy, as well as monitoring development sin digitalisation in Sweden and abroad. Lastly, an Agency for Digital Government which exists to support digitalisation solely in the field of government services.

The national innovation agency of Sweden, Vinnova, is also worth mentioning when thinking of industry 4.0 in the country. Vinnova partly funds the Production 2030 strategic research and innovation programme. This programme involves research institutes, universities, and companies in a platform which provides funding to try and make Sweden a frontrunner when it comes to investing in sustainable production. This in turn has its origin in the Made in Sweden 2030 strategic research and innovation agenda.

Ambient/Active Assisted Living

Since 2006 the Swedish government has had various e-health strategies, updated on a regular basis. The latest and current one of these is the E-Health 2025 strategy. This promises to harness digitalisation in order to improve the lives of patients in the health system and care recipients, including the elderly. This includes focus on helping the elderly to be able to live in their own homes through the provision of digital support.

The National Strategy for Life Science also takes aim at ambient assisted living, or "welfare technology" as it is usually referred to locally, though no specific reference to the wood & furniture sector is made in it.
The Swedish National Board of Health and Welfare offers three online courses on the topic of welfare technology on the following topics:

- E-health and welfare technology in social services
- Safety alarms and systematic quality work
- Ethics and integrity when introducing welfare technology

As a Nordic country, Sweden also takes part in the "Nordic Welfare Solutions" initiative of the Nordic Council of Ministers, already mentioned in the case of Denmark. focus on Ambient Assisted Living (AAL). Nordic Welfare Solutions attempts to be a vehicle for demonstrating the Nordic region's achievements in AAL internationally.

Circular Economy

A Swedish initiative exists for certifying furniture. Under the name Möbelfakta, it is a joint initiative of the IVL Swedish Environmental Research Institute and The Swedish Federation of Wood and Furniture Industry (TMF). Möbelfakta maintains a database which tracks all furniture in Sweden which meets its standards in terms of three main areas: quality, environment, and responsible supply chains. As regards wooden pieces

of furniture, the environmental standards they must meet includes that the raw materials used must be legally sourced, as well as regulating that maintenance instructions are included.

The Swedish government has set up multiple initiatives to support the transition to a more circular economy. One of these is the Delegation for Circular Economy, established in 2018. It's main tasks include: developing a strategy for a circular and bio-based economy, being a contact point between different actors, identifying obstacles and suggesting cost-effective measures to the government, setting up a knowledge centre where good examples of circular initiatives will be shared.

Another initiative of the Swedish government in this direction is an Innovation Partnership Programme in Climate Neutral Industry, which includes strengthening industry's transition to circular business models as one of its main focuses.

Furthermore, the Swedish government has set up a strategy for transition to circular economy. This is broadly broken down into four focus areas: sustainable product design and production, sustainable ways to consume and use, non-toxic and circular material cycles, and providing a driving force for business by promoting innovation and circular economy business models.

Lastly, as in the case of Denmark, the "Nordic Swan Ecolabel" is also used to promote circular economy in the Swedish W&F sector. This product label marks items as meeting certain sustainability criteria created by the Nordic Council of Ministers in 1989. In terms of its use on wood, in 2021 the ecolabel introduced new Circular Economy criteria for indoor and outdoor furniture, including playground and park equipment, to qualify for being labelled. Some of these stricter criteria are: use of wood from legal, traceable, and largely sustainably managed sources; use of more durable wood; circular design to promote resource recovery; use of plastic and metal parts of which a high share is recycled material; and limits on energy consumed in the process of making wood-based boards and laminate.

Education in Wood & Furniture

Four main educational pathways exist for entering into the wood & furniture industry in Sweden:

- The first pathway, gymnasium, allows students to study *wood technology*. This tends to allow for two different types of specialisation: one in industrial craftmanship and another on modern manufacturing technology. Further gymnasium courses which enable students to transition into the W&F industry are the *industrial technology* programme and the *building and construction* programme.
- The next, trade education for adults is primarily aimed at those aiming to switch career as an adult. It can be primarily set in the classroom or on the workfloor. This type of education in W&F can also be carried out as a part of "labour market training", i.e. specialised training for people who would otherwise struggle to find their way into the labour market. In these cases it is offered as more bite-sized courses, for example in mechanical carpentry or surface treatment.
- Following this is the option of entering the W&F industry through trade high school. This type of education is generally of a higher level than gymnasium studies and usually also requires students to have completed gymnasium or an equivalent level. Studies at this level usually last 2 years. They are also led by a special group compose of more than 50% figures from the industry who have the ability to make adjustments to the content of the course.
- Lastly, there are also W&F educations available at university and "high school". These include subjects such as *furniture design*, *forest and wood technology*, and *wood construction*.

An interesting institution in Sweden relative to ALLVIEW is Teknikcollege. This is a cooperation platform which works with education providers, companies, and public authorities in order to improve the quality of

technically oriented education courses and so raise competency levels within industry. It has existed since 2003 and is run by a combination of the Industry Council of Sweden and certain regions. Teknikcollege actually certifies educations which meet a set of criteria that it sets for education which is tailored to the needs of the industry it is preparing students for. It certifies courses and trainings in all four of the above-mentioned sections of the Swedish educational system which facilitate entry the W&F industry.

The Industry Council also has its own "development councils" which deal with challenges facing industry in the country and one of these is for competency-raising and questions related to Teknikcollege. This body brings together actors dealing with the certification of education and representatives of industry, including a representative of TMF - the Swedish Federation of the Wood and Furniture Industry.

Bulgaria

Industry 4.0

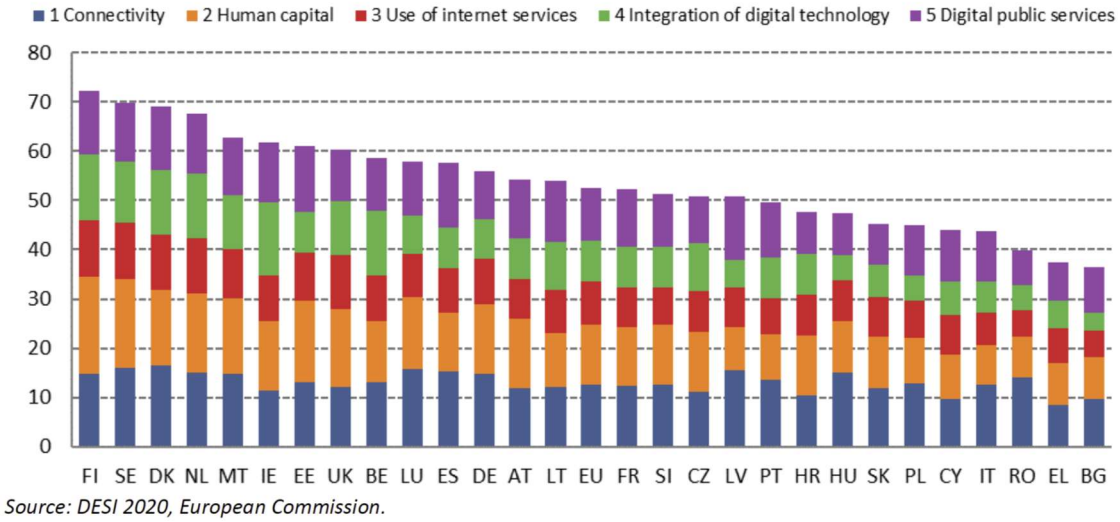
The EC "Monitoring Progress In National Initiatives On Digitising Industry" country report on Bulgaria allocates the country to the low-performer group when it comes to digitalisation in the manufacturing sector (cf. *EC 2019* and SWOT in Table 1). "Its low performance in digital skills, digitisation of businesses and of public services are considered to be acting as a brake to the further development of Bulgaria's digital economy and society. SMEs rarely use electronic sales channels and their turnover from on-line sales is the lowest in the EU". Though there is a national program "IT career training" to support digital skills development on VET level (initial and continuing, cf. details in *EC 2019*).

Bulgaria is a highly export-oriented country, with nearly 90% of local furniture production exported. In the last five years, furniture exports increased faster than production that registered an increase of 21%. Germany is the largest destination country. Bulgaria is also an increasingly open market, with imports growing more quickly than consumption (*Bulgaria Furniture Outlook 2020*).

*Table 3: SWOT of Lithuania on digitalisation (*EC 2019*)*

Strengths:	Weaknesses:
• Existence of programming documents to build on: a concept note and a national programme • Potential for establishment of Digital Innovation Hubs DIHs as an outcome of an on-going EU project	• Low overall level of digitisation for individuals and businesses. • Low overall level of digital skills in the country for both individuals and businesses. • Poor quality of education and training in digital skills. • Lack of incentives to support businesses in the digitisation and few support mechanisms. • Insufficient coordination of policy measures and information dissemination • Lack of sufficient financial resources both in term of funding from the government and private investments (technological change requires significant investments). • Regulatory framework remains insufficiently fit for the digital era.
Opportunities:	Threats:
• Emergence of new value chains, new business models, increased competitiveness of companies.	• Disappearing of professions and emergence of new professions, constant need for qualification and retraining of staff.

• Increased access to European and global markets. • Attracting external IT experts, including from the Bulgarian diaspora to the country	• Leakage of knowledge and technology: patents developed in the country registered outside by foreign companies • Lack of human capital. • Digital "exclusion" of remote, sparsely populated and rural areas.



Source: DESI 2020, European Commission.

Figure 8: EC Digital Economy and Society Index 2020 for 28 EU countries

Ambient/Active Assisted Living

First of all, this topic concerns Bulgaria from a demographic point of view as the fertility rate is at 1.6 births per woman and increasing living standards are leading to a higher percentage of elderly people in the population (*World Bank 2020*). Hence, in the future there will be a smaller workforce available for the manufacturing sector and more assisted living products needed.

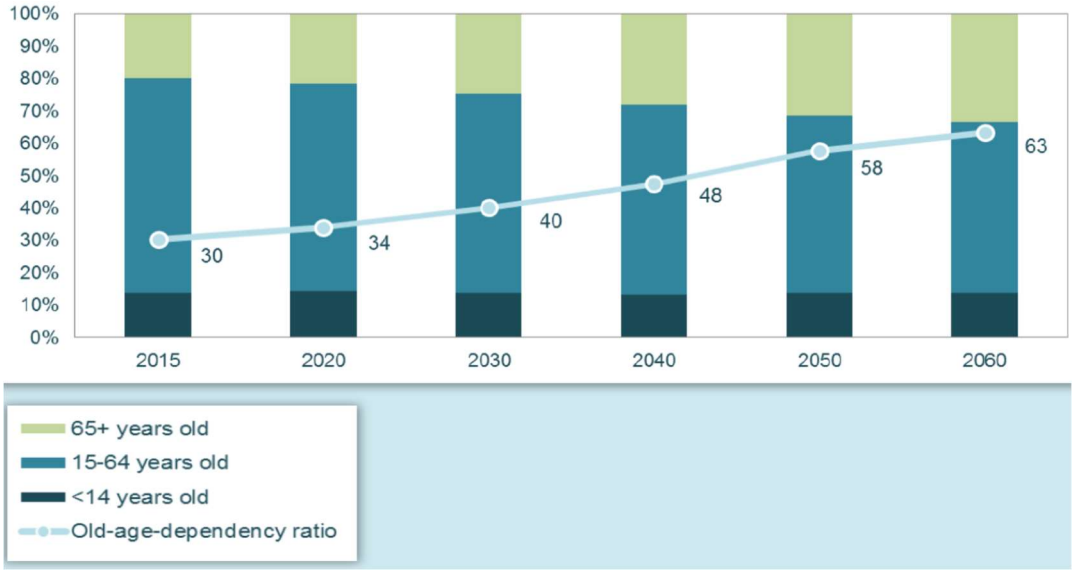
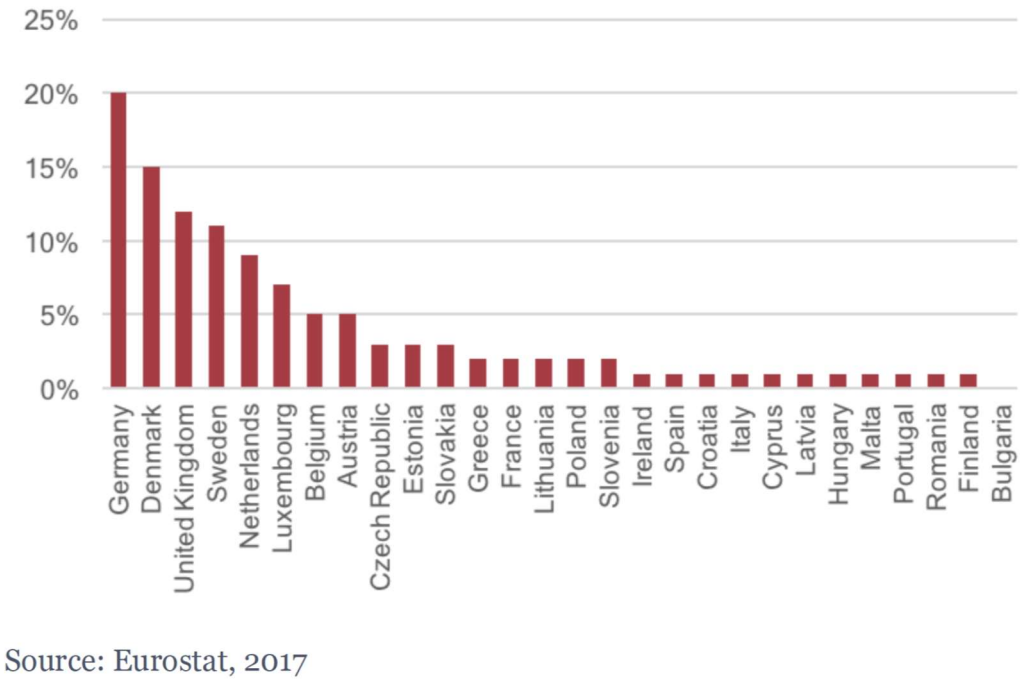


Figure 9: Population forecast by age group and old-age-dependeny ratio. This indicatior is is the ratio between the number of persons aged 65 and over (age when they are generally economically inactive) and the number of persons aged between 15 and 64. The value is expressed per 100 persons of working age (15-64) (from Cedefop 2018).



Source: Eurostat, 2017

Figure 10: Percentage of 55 to 74 years odl that purchase medicine online

According to the Technopolis AAL market report *2018*, AAL is not yet relevant in Bulgaria (e.g. figure 3)

Corporate Social Responsibility & Circular Economy

Corporate Social Responsibility & Circular Economy related issues gained substantial momentum among Lithuanian companies in recent years (*Stefanova 2020*). Further nationat training initiatives are mentioned in the same report, however there is a strong focus on Higher Education (not on VET). For instance , the

Faculty of Economics and Business Administration at the Sofia University "St. Kliment Ohridski" – master program "Management of Human Resources" included CSR into their study program, as early as 2007.

Education in Wood & Furniture

According to the EC Country Report Lithuania 2020, the government is "*continuing to modernise its vocational education and training (VET) system. The consolidation of the providers of VET continues. The number of public VET providers is planned to decrease further from 61 in 2019 to 56 in 2020. The introduction of the modular VET curriculum is advancing well, with around 70% of VET students studying in modular programmes in 2019. However, enrolment in upper-secondary VET is among the lowest in the EU, with just 27.4% of all upper-secondary students in 2017 undertaking VET programmes vs. an EU average of 47.8%. This highlights a substantial under-utilisation of the potential of VET to contribute to addressing national and regional skills challenges and mismatches in Lithuania*". The predominantly school-based VET system is being reformed towards more practice oriented and apprenticeship schemes. However, the VET system is not yet sufficiently accounting for industry 4.0, AAL and CSR/Circular Economy and teachers and trainers lack up-to date knowledge, teaching and training skills (*Cedefop*; Qualifications and Vocational Education and Training Development Centre (2019) Vocational education and training in Europe: Lithuania). These lacks are accounted for through teacher training programs. However, the teachers being neither professionals from the manufacturing industry nor experts in these recently emerging topics other and more industry connected mechanisms should be introduced.

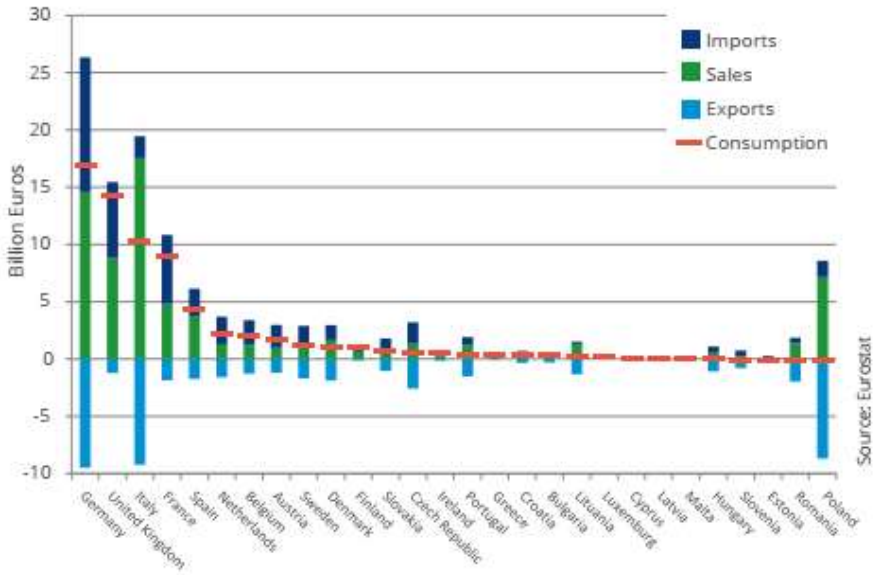


Figure 11: Furniture Production, import and export Values by Member State. Circular Economy Opportunities In The Furniture Sector, EEB, 2017

Portugal

Industry 4.0

What policies Portugal has implemented/is implementing/will implement in this area.
Programa Portugal Indústria 4.: for the National Strategy for the Digitization of the Economy, the Ministry of Economy is trying to boost the development of national industry and services in the new paradigm of the Digital Economy, through a set of measures based on in three lines of action:

1. *Accelerate the adoption of i4.0 by the Portuguese business sector*
   Provide the business sector with knowledge and information through the Capacitar i4.0 programme, implemented in conjunction with the InCoDe.2030 initiative, of which IAPMEI is one of the driving agents, and promote a set of tools that facilitate business transformation.
2. *Promote Portuguese technology providers as i4.0 players*
   Capitalize on the scientific and technological ecosystem, creating a favourable context for the development of i4.0 start-ups that can present projects with an impact on the digitization of the economy.

3. Make Portugal an attractive pole for investment in i4.0

Communicate Portugal as a HUB for sharing experiences and know-how to attract resources, creating favourable conditions (legal and fiscal) for investment directed at Industry 4.0.
This initiative is within the framework of the DigiBEST project and will finish in 2023.

Portugal Digital: is an action plan designed to be the country's transformation engine. Through the digital empowerment of People, the digital transformation of Companies and the digitization of the State. Its purpose is to accelerate Portugal, without leaving anyone behind, and project the country in the world. The Digital Transition Action Plan has the focus areas of digital empowerment of people, digital transformation of businesses and digitalisation of the digital transformation of enterprises and the digitisation of the state. This Digital Transition Action Plan reflects the strategy defined for the digital transition and encapsulates the Government's vision for the digital defined for the digital transition and condenses the Government's vision for the digital transition. It is materialised in a structure that includes three main pillars of action and an additional catalytic dimension that creates the conditions for an accelerated digitisation of the conditions for an accelerated digitisation of the country:

- -Pillar I - Empowerment and digital inclusion of people
- -Pillar II - Digital transformation of the business fabric
- -Pillar III - Digitalization of the State.

Ambient/Active Assisted Living

What policies Portugal has implemented/is implementing/will implement in this area.
AAL solutions aim at supporting people with special needs through technology, so physically impaired and elderly people can maintain an independent living in their own homes. According to Portuguese statistics, the population in Portugal is increasingly ageing due to higher life expectancy, life conditions and lower natality rates. In 1960, the proportion of elderly people represented 8% of the population, whereas in 2009 it doubled to 17,9%.
Despite these numbers, Portugal does not have a national Programme specifically oriented to AAL, but innovative research projects can be financed thorough other national R&D calls or European programmes calls for proposals. At a European level, one strong example of the Portuguese community activity is the participation of several Portuguese organizations in EIP AHA - European Innovation Partnership on Active and Healthy Ageing. At a national level, Portugal built on an active AAL community that has been evolving and continuously involves in several initiatives and projects:

- AAL4AAL - Portuguese Health Cluster mobilizes actors on AAL - Ambient Assisted Living
- Ageing Well Thematic Network – Promoting the market uptake of ICT solutions
- Ageing@coimbra - A European Reference Region in the Center Region of Portugal

Furthermore, the Active and Assisted Living Program is a European initiative that aims to support better quality of life for older people and to strengthen industrial opportunities while ensuring sustainability of our health systems. This programme promotes innovative technological product ideas and services for active and healthy ageing, supporting them until they launch on the market, by funding projects that work towards creating market-ready products and services for older people. Each project consists of SMEs, research bodies and end-user organisations. Within this programme we can find several projects which Portugal is part of:

- "Fatigability in Outcomes to monitor Resilience Targets in Older persons" measurement & monitoring platform (FORTO 2.0).
- FaceRehab - a solution for supporting facial rehabilitation exercises at home using technology as a mean to improve digital transformation of the health and care for people affected with Facial Paralysis
- T4ME2 (Toilet 4 me). This project develops and evaluates new types of supportive, autonomy promoting, smart toilet solutions for ageing people and persons of all ages with impairments/disabilities.

Corporate Social Responsibility & Circular Economy

CSR is a set of policies and practices adopted by a company, in a voluntary basis, with the objective of meeting the needs of their stakeholders, as much as fulfilling their search for profit and legal compliance (EC, 2001). Since Portugal is a country with a strong awareness of both issues, we can consider several examples within the circular economy.

Action plan for circular economy in Portugal (2017-2020): among other initiatives in this plan, regarding the actions that they were planning, building-blocs of circular economy:

- Design: designing products and services for a circular economy
- Technologies and new business models
- Reverse cycles (e.g. reverse logistics): a robust system of reverse logistics that is close to the customer, flexible and effective is a guarantee that products, components and materials will be returned to the manufacturer for new use cycles
- Promoters / favourable context: for it to become common in manufacturing to actively reduce impacts, multiply use cycles, increase resource productivity and value performance over property, the market must be beneficial.

The Bio-based Industries Consortium (BIC): industry association putting circularity, innovation and sustainability at the heart of the European bioeconomy. Portugal is growing bioeconomy sector already contributes almost 20 bn€ to its economy and the BIC report identifies new opportunities to fast-track green economic growth.

"The sustainable bioeconomy is taking on an increasingly crucial role in Portuguese and European society. Now is the time to realise the benefits of this model and identify the best opportunities and solutions to support companies in creating more sustainable products and services", says João Pedro Matos Fernandes, Portugal's Minister for the Environment and Climate Action.

InC2: Portugal's new National Circular Cities Initiative, known as InC2, is designed to "support and empower municipalities and their communities in the transition to a circular economy". InC2 will support four networks of six to eight 'circular cities' on different thematic, with a Local Group in each city involving different levels of governance. This initiative is within the framework of URBACT programme which is the European Territorial Cooperation programme aiming to foster sustainable integrated urban development in cities across Europe.

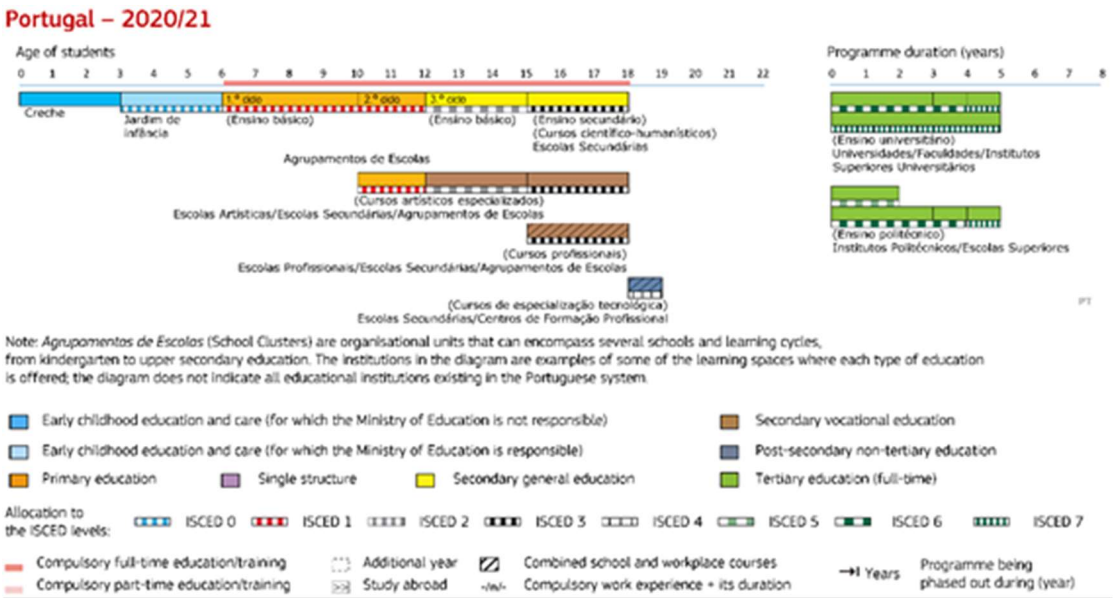
Published order that identifies the 1002 priority parishes for the inspection of fuel management: The identification of these priority parishes allows for an efficient use of the human and technical resources of the entities involved in monitoring compliance with land cleaning rules, in a context of enormous pressure on public resources resulting from the fight against the Covid-19 pandemic and when it is in causes a territorial dimension that exceeds 6 million hectares.

Education in Wood & Furniture

Education in Portugal is organised according to the democratic principles established by the Constitution of the Republic (1976). The Portuguese education system is divided in pre-school education (from the age of three until the start of basic education), basic education (six to 15 years old), upper secondary education (15 to 18 years old), post-secondary non-higher education, higher education and adult education and training.

Higher education is the responsibility of the Ministry of Science, Technology and Higher Education (Ministério da Ciência, Tecnologia e Ensino Superior - MCTES), which is also responsible for defining and implementing policies affecting the national science and technology system. The Ministry of Education (Ministério da Educação - ME) is the governmental department responsible for defining, coordinating, implementing and evaluating national policy regarding the education system (pre-school, basic, upper secondary and out-of-school education), as well as for articulating education policy with qualification and vocational training policies.

Both vocational education and training, as well as adult education and training are the joint responsibility of the Ministry of Education and the Ministry of Labour, Solidarity and Social Security (Ministério do Trabalho, Solidariedade e Segurança Social – MTSSS). The duties of these ministries are undertaken by departments that are part of direct state administration, indirect state administration bodies, advisory bodies, and other organisations and entities within state-owned enterprises.



Structure of the national education system

Concerning education in Portugal regarding the furniture and wood sector the main public education institution is the CFPIMM. The Vocational Training Centre of Wood and Furniture Industries (CFPIMM), located in Lordelo, Paredes, Portugal, is a public and non-profit organization, created by protocol celebrated between the national Institute of Employment and Vocational Training (IEFP), and the Association of Portuguese Wood and Furniture Industries (AIMMP). CFPIMM develops both educational and vocational courses for youngsters (dual system) and for adults (dual system and professional certification). CFPIMM is the sole institution, with national coverage, responsible for the recognition of qualifications in the wood and furniture sector, has long experience in preparation of training offer for the sector.

CFPIMM has a Management Quality System and is a certified organization in ISO 9001, since 2003. CFPIMM's activity is divided into the following major training strands: Initial Training, Continuous Training and Professional Certification for workers from de wood and furniture sector. Within Initial Training, CFPIMM offers courses with three years duration and with equivalence to secondary school – Apprenticeship Program, and also training courses of one year duration for young and adults searching for their first job – Initial Qualification Program.

As to private education training in wood and furniture, the Cedeira Arts and Crafts School offers some Green Woodworking courses such as "Introduction to Green Wood Furniture Making" or "Green Wood Chair Making". The small team of skilled and experienced green wood furniture makers hand-craft lamps, tables, chairs and desks using a 'slow' and sustainable methodology that relies on low energy and simple technology. Artlier, a space for sharing knowledge in the are of arts and crafts also offers a workshop named "Furniture restoration and recycling". In this course you can learn how to repair your furniture through different methods.

Allview

5

Conclusion

5. Conclusion

This Deliverable has sought to bring together information on the state of the Wood & Furniture industry in a broad range of regions across Europe in order to create a basis for understanding the current situation of the industry and how ALLVIEW can bring improvement, especially by working to close the skills gap and updating curricula by bringing in extra focus on the project's thematic areas: Industry 4.0, Ambient Assisted Living, and Corporate Social Responsibility.

Firstly, the different regional partners observed the ecosystem of the W&F industry in their region/country and mapped it out. Secondly, information on the Strengths, Weaknesses, Opportunities, and Threats relevant to the W&F industry in each region was collected and added some assessment on how those regional SWOT analyses compare to each other, and thus how the industry varies from place to place. Thirdly, information was reported on 7 other non-project countries.
The thematic areas of the project have all been assessed in the context of all 15 countries looked at in this Deliverable.

While there is clear cross-over between certain aspects of the W&F sector in the partners' respective regions, there are also differences in other aspects. A handful list of conclusions can still be drawn on the basis of the information collected, including that:

i. A "war for talent" generally troubles the sector, which often struggles to attract new/young workers and suffers a loss of workers through retirement among an ageing workforce.
ii. Social inclusion measures in order to help hard-to-employ groups are already widely used in some regions. In other regions, these measures are viewed as an interesting solution to the above concerns about difficulties in attracting workers.
iii. Education for the W&F sector is not always viewed as adequate. One country contrasts cutting-edge academic training with vocational training which lacks adequate industry connections and the right tools.
iv. Different regions report different levels of connectivity between W&F education and the W&F industry, from high to insufficient, though all seemingly agree that it is ideal to have and that dual training should play an important role in the sector.
v. Industry 4.0 and digital technologies are often mentioned as being increasingly taken into use in the sector, including for making products more customer specific. Increasing the prominence of such techniques in W&F education may bring major benefits in terms of preparing students to apply the latest techniques in their future work.
vi. Many regions report high awareness of Circular Economy and its importance. This awareness exists either among education, industry, or simply in general. Circular Economy is viewed as a way to attract workers due to wood's image as a sustainable material, although concerns about deforestation do worry some people.
vii. Numerous regions report threats in terms of increasing furniture imports from places with lower production costs. In this sense, ALLVIEW may provide solutions to these problems if raising the quality of W&F education allows the

sector to compete better on the basis of providing high quality, rather than on price.

In order to try and improve the education provided to individuals entering the W&F industry, ALLVIEW WP6 will ultimately seek to revise and update the existing curricula in all regions being integrated with courses on ALVIEW's thematic areas. In that way, after updating the curricula, individuals entering the sector since engaged in vocational education pathways will be properly trained as far as how Industry 4.0, Ambient Assisted Living, and Corporate Social Responsibility are relevant subjects for guaranteeing better and higher-quality W&F products.

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